

11. Ans. (3)

Total 5 structural isomers are possible for M.F. $\rightarrow C_6H_{14}$

(i) $CH_3-CH_2-CH_2-CH_2-CH_2-CH_3$ (n-hexane)

(ii) $CH_3-CH_2-CH_2-\underset{\begin{array}{c} | \\ CH_3 \end{array}}{CH}-CH_3$ (2-Methyl pentane)

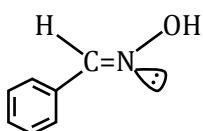
(iii) $CH_3-CH_2-\underset{\begin{array}{c} | \\ CH_3 \end{array}}{CH}-CH_2-CH_3$ (3-Methyl pentane)

(iv) $CH_3-\underset{\begin{array}{c} | \\ CH_3 \end{array}}{CH}-\underset{\begin{array}{c} | \\ CH_3 \end{array}}{CH}-CH_3$ (2,3-Dimethyl butane)

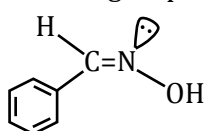
(v) $CH_3-\underset{\begin{array}{c} | \\ CH_3 \end{array}}{C}-CH_2-CH_3$ (2,2-Dimethyl butane)

12. Ans. (4)

In Benzaldoxime, the carbon of oxime should be attached with two different groups.

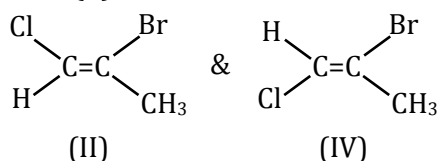


When H and OH are on same side $\rightarrow$ 'Syn' isomer



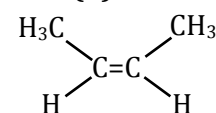
When H and OH are on opposite side $\rightarrow$ 'Anti' isomer

13. Ans. (3)



(II) & (IV) are geometrical isomers, due to presence of same M.F. but different relative arrangement across restricted system.

14. Ans. (3)



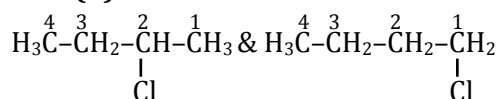
Shows G.I. due to same M.F. & different relative arrangement across restricted system.

15. Ans. (2)



For cyclic compound, any two carbon in the cycle should be attached with two different groups to show G.I.

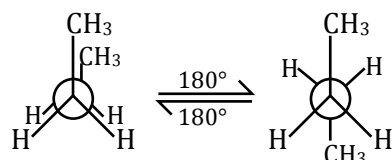
16. Ans. (2)



2-chlorobutane 1-chlorobutane

These are position isomers.

17. Ans. (2)



(Fully eclipsed)

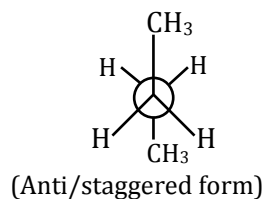
Minimum Stable

(Anti form)

Maximum Stable

18. Ans. (2)

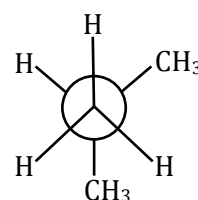
Anti/staggered conformation of butane will have the minimum energy & maximum stability because the methyl groups are as far away from each other as possible.



(Anti/staggered form)

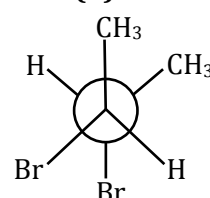
19. Ans. (4)

Isobutane $CH_3-\underset{\begin{array}{c} | \\ CH_3 \end{array}}{CH}-CH_3$



This structure is most stable conformer of isobutane because bulky group are far away from each other.

20. Ans. (3)



It is not the conformer as this configuration cannot be obtain after rotating other conformers to certain angle.

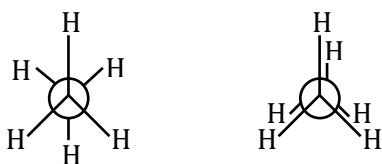
Exercise-II (Previous Year Questions)

1. Ans. (3)

M.F. $\Rightarrow$ C_3H_9N (i) $CH_3-CH_2-CH_2-NH_2$ 1° Amine(ii) $CH_3-\underset{\substack{| \\ NH_2}}{CH}-CH_3$ 1° Amine(iii) $H_3C-NH-CH_2-CH_3$ 2° Amine(iv) $H_3C-\underset{\substack{| \\ CH_3}}{N}-CH_3$ 3° Amine

Total (4) structural isomers are possible.

2. Ans. (4)



(Staggered form) (Eclipsed form)

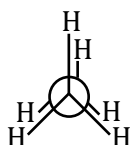
 $\therefore$ Staggered form is more stable than eclipsed form, because it has minimum repulsion.

3. Ans. (3)

Conformers are the isomers which are formed by rotation about single bonds (with at least 3 continuous σ bonds)

So there is no effect on bond angle as well as bond length.

4. Ans. (4)

The dihedral angle of the least stable conformer (Eclipsed) of ethane is 0° 

5. Ans. (4)

Compounds having different alkyl groups attached with polyvalent functional Group show metamerism.

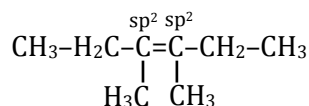
(i) $C_5H_{12} \rightarrow$ No polyvalent functional Group, so no metamerism.(ii) $C_3H_8O \rightarrow CH_3-O-CH_2-CH_3$ (Only one arrangement possible, so no metamerism)(iii) $C_3H_6O \rightarrow CH_3-\underset{\substack{|| \\ O}}{C}-CH_3$ (Only one arrangement possible, so no metamerism)(iv) $C_4H_{10}O \rightarrow CH_3-CH_2-O-CH_2-CH_3$

&

 $CH_3-O-CH_2-CH_2-CH_3$

(shows & metamerism)

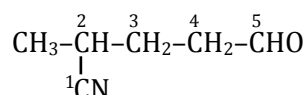
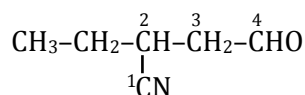
6. Ans. (4)



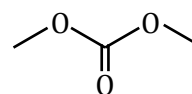
Exercise-III (Analytical Questions)

1. Ans. (2)

Isomers, having different no. of carbon atom in the main chain or in side chain, are chain isomers.



2. Ans. (3)



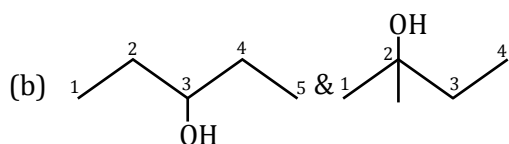
It is not a functional group isomer of other because it has different molecular formula.

3. Ans. (4)

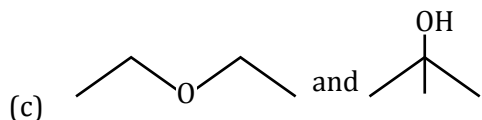
 $C_4H_{10}O$ can have following metamers except isobutyl alcohol.(i) $CH_3-CH_2-O-CH_2-CH_3$ (ii) $CH_3-O-CH_2-CH_2-CH_3$ (iii) $CH_3-O-\underset{\substack{| \\ CH_3}}{CH}-CH_3$ (iv) $CH_3-\underset{\substack{| \\ CH_3}}{CH}-CH_2-OH$ (Isobutyl alcohol can never be metamer of $C_4H_{10}O$, due to different fn. group)

4. Ans. (2)

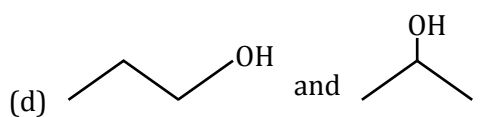
(a) & $\rightarrow$ Different alkyl groups across polyvalent fn. group $\Rightarrow$ Metamers (s)



→ Same M.F. but diff. no. of 'C' atoms in main chain or in side-chain ⇒ Chain Isomers (q)



→ Same M.F., Different fn. group ⇒ fn. group isomers (r)

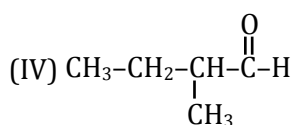
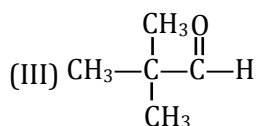
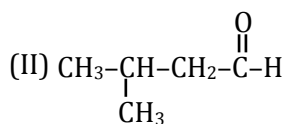
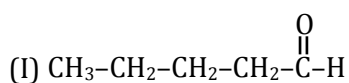


→ Same M.F., but diff. position of fn. group ⇒ positional isomers (p)

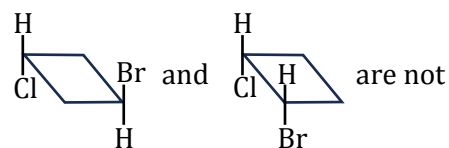
a = s, b = q, c = r, d = ps

5. **Ans. (1)**

These 4 aldehydes are possible with mol. Formula $C_5H_{10}O$



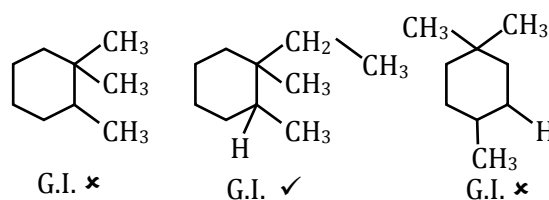
6. **Ans. (2)**



geometrical isomerism as they have different constitution (structure).

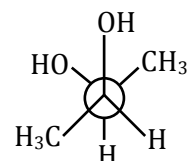
7. **Ans. (2)**

For cyclic compounds, any two carbon in the cycle should be attached with two different groups.



8. **Ans. (3)**

Most stable conformation of 2,3-butanediol is:-



Due to H-bonding & minimum repulsion between two CH_3 groups.