Exercise

Marked Questions may have for Revision Questions.

PART - I : ONLY ONE OPTION CORRECT TYPE

Section (A) : Degree of unsaturation and catalytic hydrogenation

1.

Sol. Degree of unsaturation = (No. of carbon atom +1) – (No. of H-atom + No. of halogen atom – No. of nitrogen atom) / 2.

2. **Sol.** 2-Methylbut-2-ene & 3-Methylbut-1-ene both gives 2-Methylbutane after hydrogenation.

3. **Sol.** Number of mole of hydrogen needed is = number of double bonds = 5

4. **Sol.** Isopentane $\Rightarrow$ $CH_3-\underset{CH_3}{\underset{|}{CH}}-CH_2-CH_3$

$CH_2=\underset{CH_3}{\underset{|}{C}}-CH_2-CH_3$, $CH_3-\underset{CH_3}{\underset{|}{C}}=CH-CH_3$, $CH_3-\underset{CH_3}{\underset{|}{CH}}-CH=CH_2$

5. **Sol.** Aromatic π bonds are stable and cannot hydrogenated at room temperature.

Section (B) : Monochloroination & ozonolysis reactions

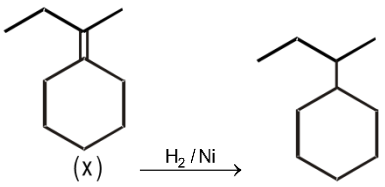
6. **Sol.** $CH_3-\underset{CH_3}{\underset{|}{CH}}-\underset{CH_3}{\underset{|}{CH}}-CH_3 \xrightarrow{Cl_2/h\nu} CH_3-\underset{CH_3}{\underset{|}{CH}}-\underset{CH_3}{\underset{|}{CH}}-CH_2Cl + CH_3-\underset{CH_3}{\underset{|}{CH}}-\underset{CH_3}{\underset{|}{\overset{Cl}{\overset{|}{C}}}}-CH_3$

7. **Sol.** 2, 2, 3, 3-Tetramethylbutane have only one type of chemically different hydrogen atom.

8. **Sol.** $CH_3-\underset{CH_3}{\underset{|}{C}}=CH-CH_3 \xrightarrow{H_2/Ni} CH_3-\underset{CH_3}{\underset{|}{CH}}-CH_2-CH_3$

$CH_3-\underset{CH_3}{\underset{|}{CH}}-CH_2-CH_3$ has four chemically different types of hydrogen atoms.

9. **Sol.** (D) has four chemically different types of hydrogen atoms.

10. **Sol.** 

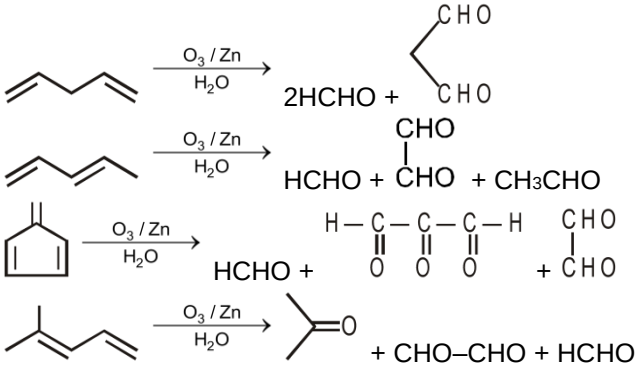
11.

Sol. $CH_2=C=CH-\underset{\underset{CH_2}{\|}}{C}-CH_3 \xrightarrow{O_3/Zn+H_2O} 2HCHO + CO_2 + CH_3—CO—CHO$

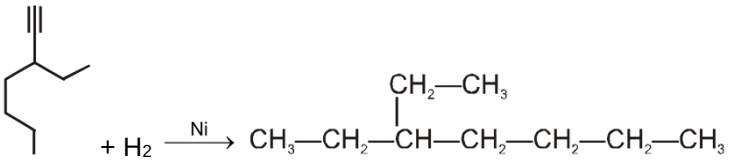
Section (C) : Test for acidic hydrogen & unsaturation

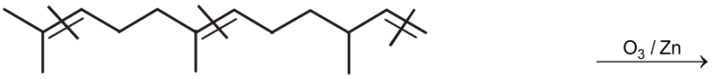
12.

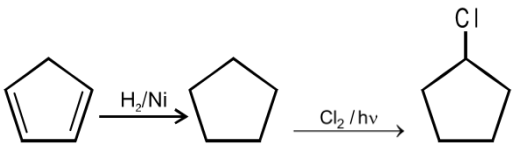
Sol.



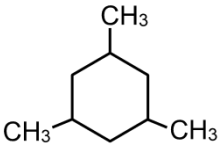
13. **Sol.**  have two types of chemically different hydrogen atom so it forms two monochloro isomers on photochemical chlorination.

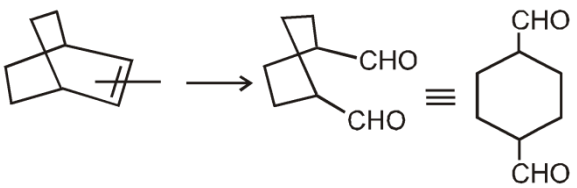
14. **Sol.** 

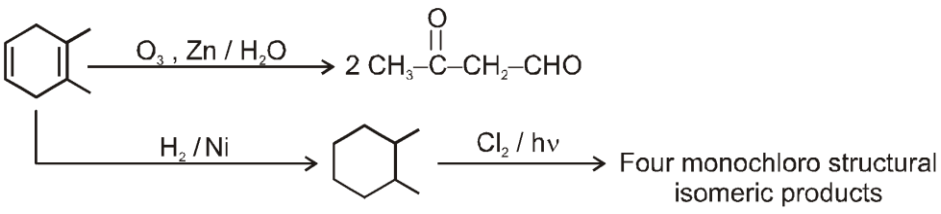
15. **Sol.**  $\xrightarrow{O_3 / Zn}$ 2-methylpentanedial+4-oxopentanal+formaldehyde+acetone.

16. **Sol.** 

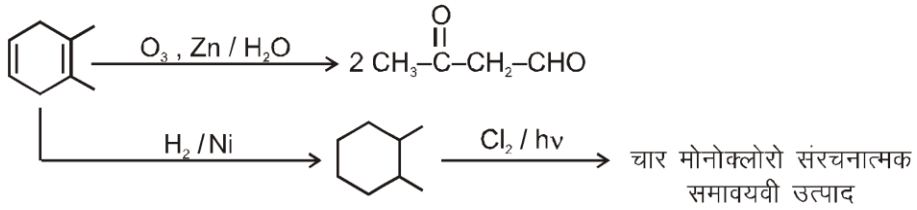
17.

Sol.  have three different types of chemically hydrogen atom.

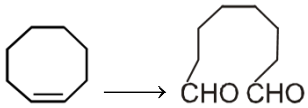
18. **Sol.** 

19. **Sol.** 

Sol.

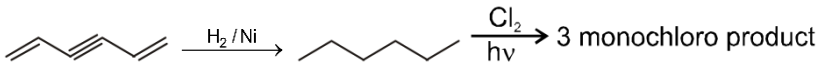


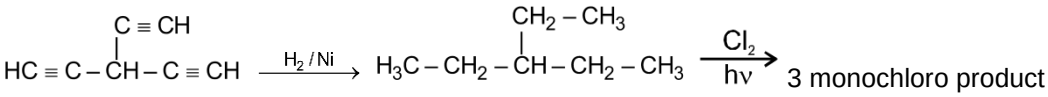
20. **Sol.**



PART - II : ONE OR MORE THAN ONE OPTIONS CORRECT TYPE

21. **Sol.**

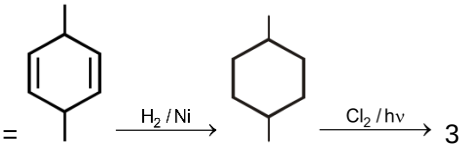




Both structures give three monochloro structural isomeric products.

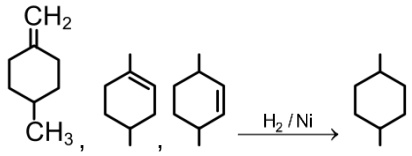
22.

Sol. X =



3 structural products

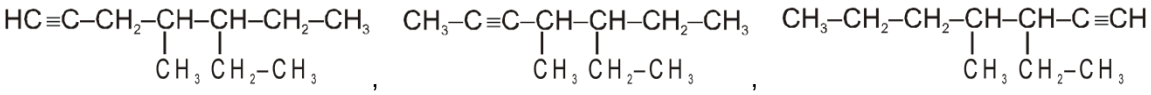
23. **Sol.**



PART - III : SINGLE AND DOUBLE VALUE INTEGER TYPE

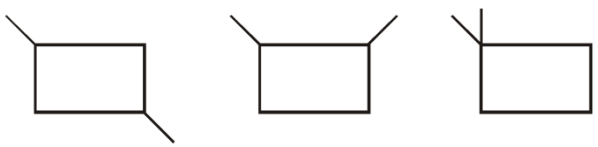
24. **Ans** 3

Sol.



25. **Ans.** 3

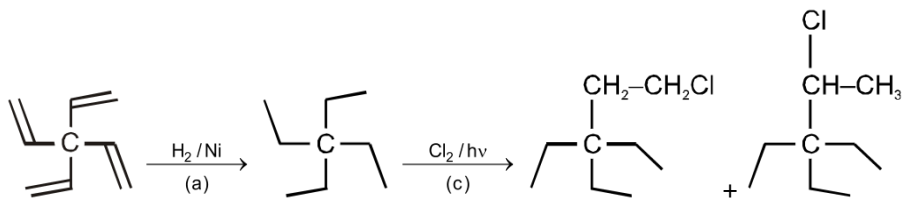
Sol.



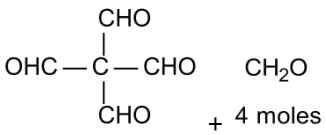
26.

Ans. 5

Sol.



(b) $\xrightarrow{O_3}$

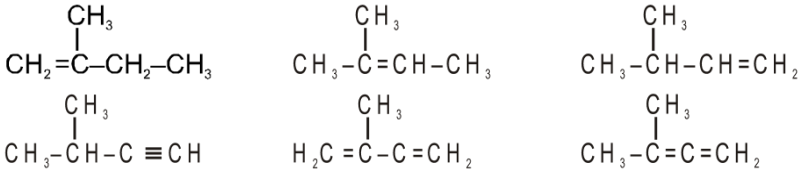


CH_2O + 4 moles

a = 1; b = 2 = c = 2 Total answer 5.

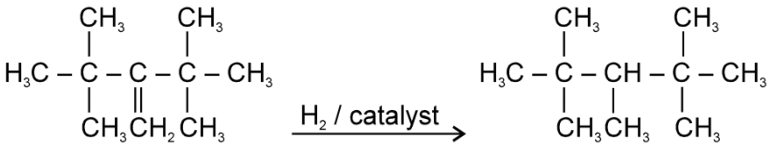
27. **Ans.** 6

Sol.



28. **Ans.** 4

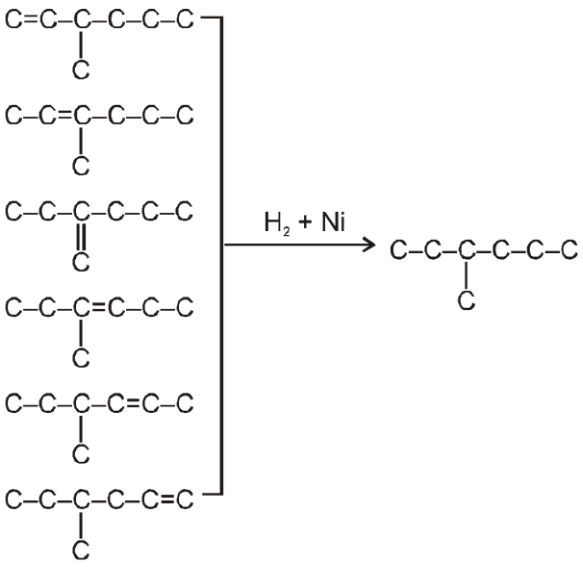
Sol. Only one alkene



Three monochloro isomers are possible as it has three different types of 'H' atoms.

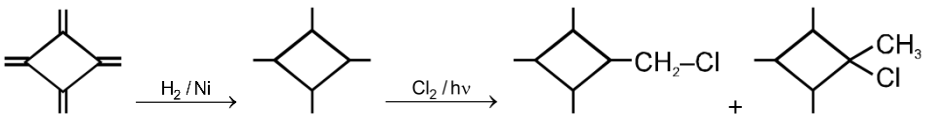
29. **Ans.** 6

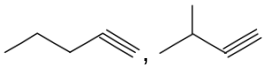
Sol.



30. **Ans.** 2

Sol.



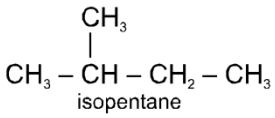
31. **Sol.** C_5H_8  (Molecular Mass = 68)

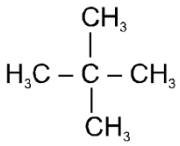
PART - IV : JEE (MAIN) / AIEEE PROBLEMS (PREVIOUS YEARS)

32. **Sol.** The number of monohalogenation products obtained from any alkane depends upon the number of different types of hydrogen it contains. Compound containing only one type of hydrogen gives only one monohalogenation product.

$CH_3CH_2CH_3$ — two types of hydrogen
propane (two monohalogenation structural product)

$CH_3CH_2CH_2CH_2CH_3$ — three types of hydrogen
pentane (two monohalogenation structural product)

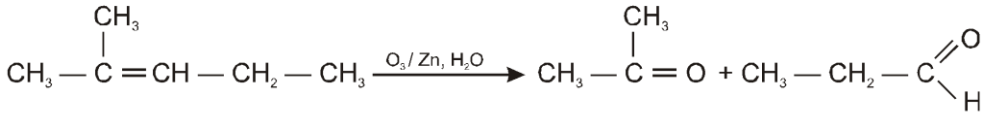

isopentane — four types of hydrogen (four monohalogenation structural product)


neopentane — one types of hydrogen (one monohalogenation structural product)

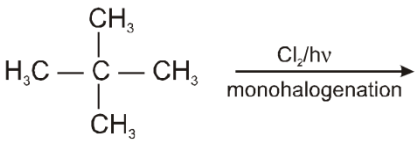
Thus the given alkane should be neopentane.

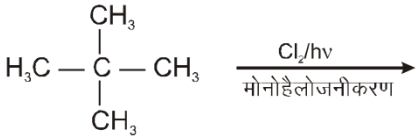
33. **Sol.** 2,3-Dimethylbutane has two chemically different hydrogen atoms so it can give two monochlorinated
structural compounds.

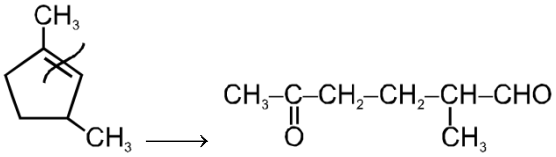
34. **Sol.** $CH_3CH{=}CHCH_3 \xrightarrow[H_2O]{O_3/Zn} 2CH_3CHO.$


(2-Methyl-2-pentene) Acetone Propionaldehyde

ol. (A)


36. **Sol.** neopentane single product.


Sol. नियोपेन्टेन ,dy mRiknA

37. **Sol.**  (5-keto-2-methyl hexanal)