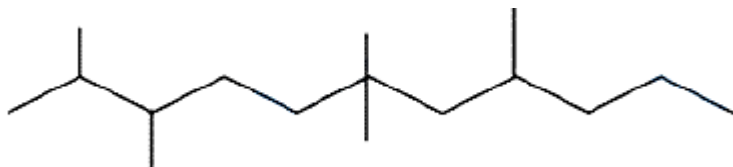


HYDROCARBONS (UT-05 QB)

NUMARICAL VALUE QUESTIONS

1. How many of the following compounds will form acetic acid KMnO_4 on reaction with acidic Prop-1-ene, 2-Methylbut-2-ene, 2-Methylpropene, But-2-ene, Cyclohexene.

2.



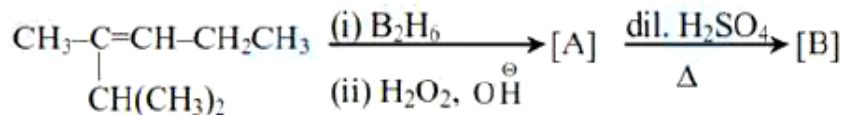
In this molecule

$X = \text{no. of } 1^\circ \text{ - carbon atoms}$

$Y = \text{no. of } 2^\circ \text{ - carbon atoms}$

$Z = \text{no. of } 3^\circ \text{ - carbon atoms}$

3. The major product [B] in the following sequence of reaction is having how many sp^3 hybridized Carbon atoms?



4. A hydrocarbon $(\text{A})\text{C}_n\text{H}_{2n-4}$ on ozonolysis gives $(\text{CH}_3)_2\text{CHCH}_2\text{CHO}$, $\text{OHCCH}_2\text{CH}_2\text{CHO}$ and CH_3COCH_3 . The value of n is
5. The number of carbonyl carbon in the product X is Propyne $\xrightarrow[\text{Zn/H}_2\text{O}]{\text{O}_3/\text{CH}_2\text{Cl}_2, \Delta} \text{X}$
6. In the following sequence of reactions the maximum number of atoms present in molecule C in sp^3 hybridised state is $\text{A} \xrightarrow{\text{Red hot tube}} \text{B} \xrightarrow[\text{AlCl}_3]{\text{CH}_3\text{Cl (1 eq.)}} \text{C}$
(A is a lowest molecular weight alkyne)
7. How many dichloro products (including stereoisomers) will be formed when R-2-chloropentane reacts with Cl_2 in presence of UV radiation?
8. Total number of products form including stereoisomers during monochlorination of 2-methylbutane?

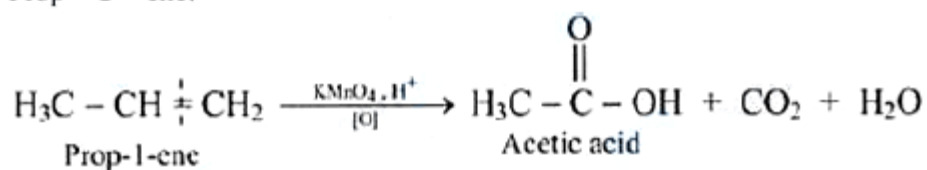
KEY

1)	3.00	2)	8	3)	6	4)	16	5)	2	6)	1	7)	7	8)	6
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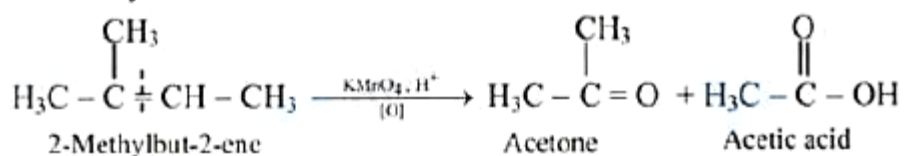
SOLUTIONS

1.

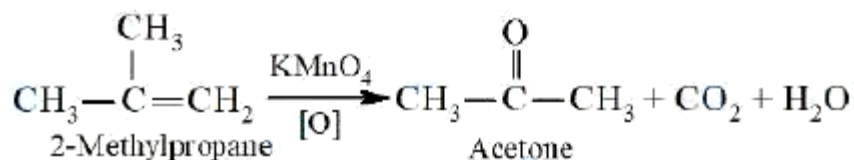
i. Prop - 1 - ene:



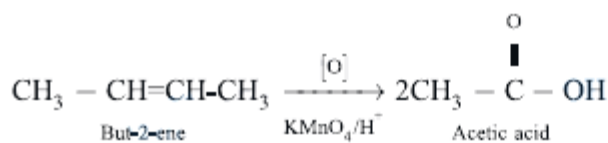
ii. 2 - Methylbut - 2 -ene:



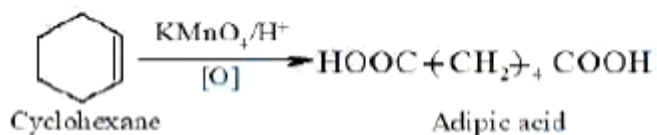
iii. 2 - Methylpropene:



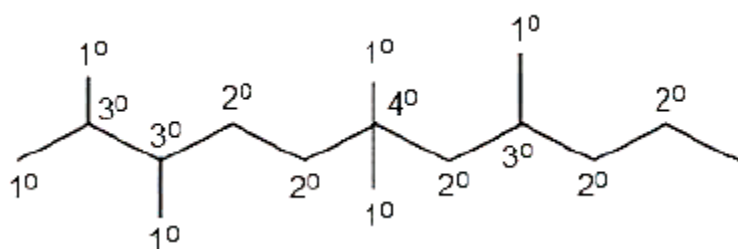
iv. But - 2 -ene



v. Cyclohexene:



2.



$$X = 7$$

$$Y = 5$$

$$Z = 3$$

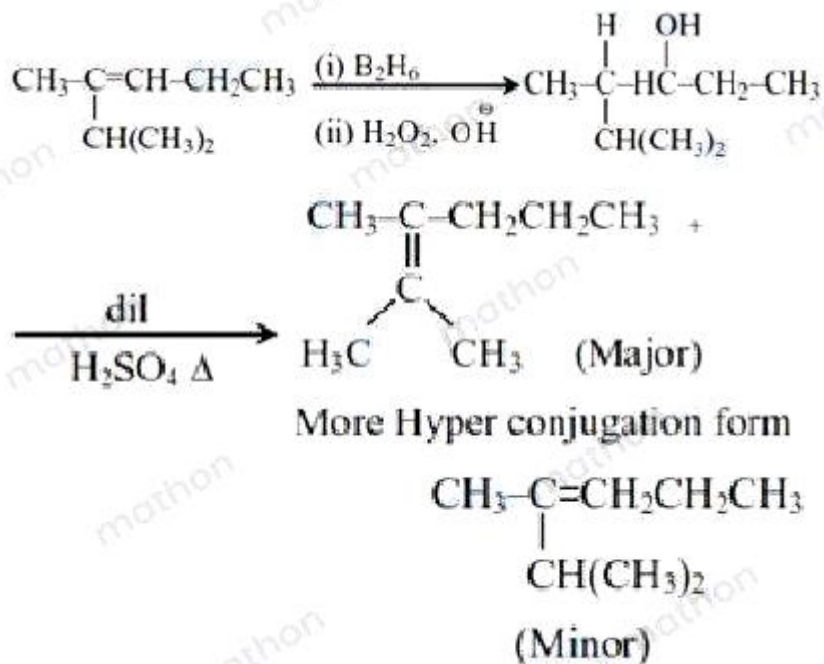
$$M = 1$$

$$= \frac{X + Y + Z + M}{2}$$

$$= \frac{16}{2}$$

$$= 8$$

3. All single bonded C-atoms are sp^3 hybridised here in major product.



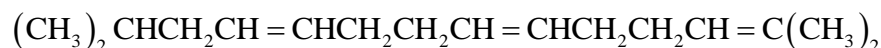
4. Based on the formula of hydrocarbon C_nH_{2n-4} the degree of unsaturation is 3. So, there is two case:

(I) 3 double bonds

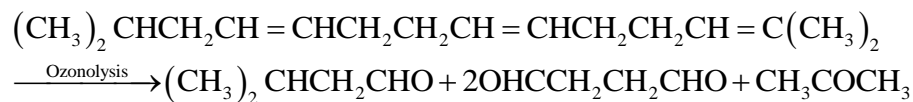
(II) 1 double bond and 1 triple bond

Second case can be easily rejected because products of ozonolysis are aldehyde or ketone rather than carboxylic acid.

So the alkene would be:



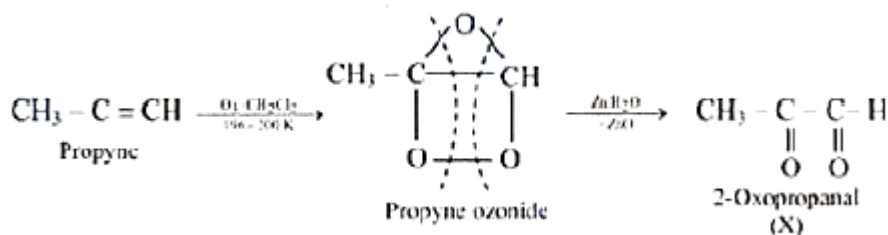
Which on ozonolysis will give products as:



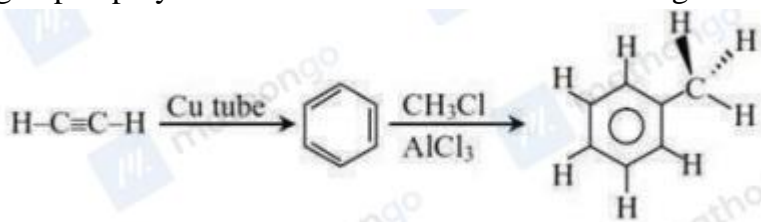
The formula of alkene is $C_{16}H_{28}$

So the value of 'x' is 16.

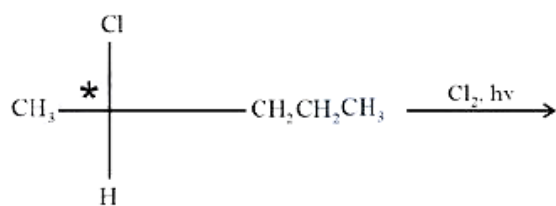
5. Ozonolysis of propyne results in the formation of 2-oxopropanal which contains keto group and aldehyde - (CHO) group. Hence, 2-oxopropanal contains two carbon atoms.



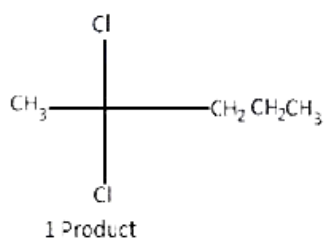
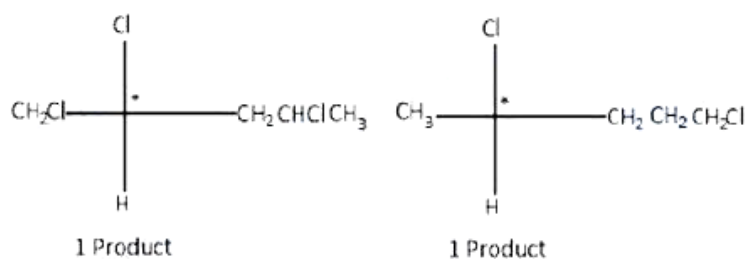
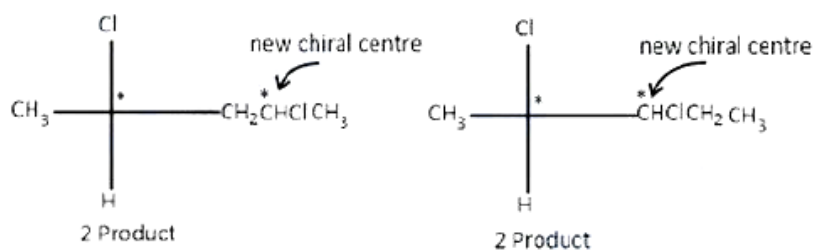
6. Here only one C-atom of CH_3 group is sp^3 hybridised rest all C-atoms of benzene ring are sp^2 -hybridised.



7.



R-2 chloropentane



Total 7 products

8.

