CBSE TEST PAPER 04

CLASS XI CHEMISTRY

(Hydrocarbons)

General Instruction:

- All questions are compulsory.
- Marks are given alongwith their questions.

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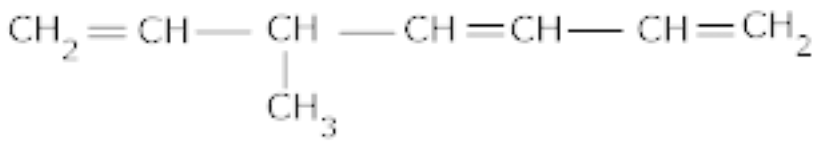
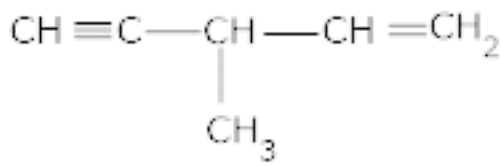
1. Why is alkene considered a weaken molecule than alkane? [1]
2. Draw orbital picture of ethane depicting σ-bond only. [2]
3. What is the origin of geometrical isomerism in alkenes? [1]
4. Write IUPAC names of the following molecules: [2]

(a) 

(b) 

5. Which of the two exhibit geometrical isomerism? 2-Butene or 1Butene. [1]
6. What is the shape of CH_2 = CH_2? [1]
7. The physical properties of geometrical isomers are different while those optical isomers are same. Why? [2]
8. Dipole moment of cis – but – 2 – ene is 0.33 D whereas dipole moment of the trans form is almost zero. Why? [2]
9. Why will C_6H_5CH =CH – CH_3 show cis – trans isomerism? [1]
10. What are geometrical isomers? [2]

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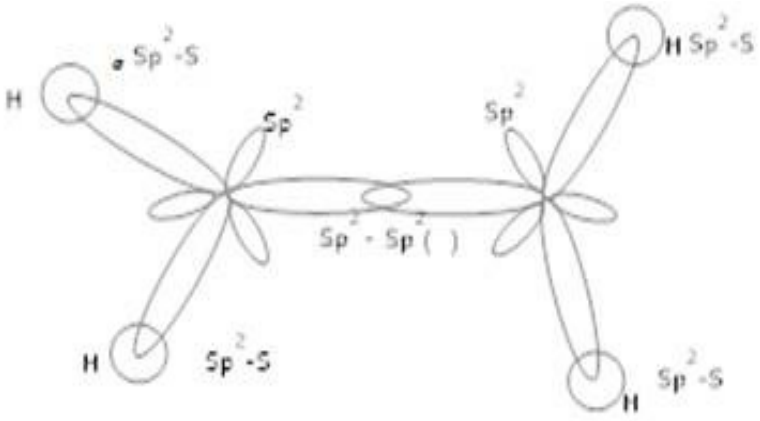
[ANSWERS]

Ans 01. The presence of weaker π-bond makes alkenes unstable molecules in comparison to alkane and thus alkenes can be changed into alkanes by combining with the electrophilic reagents.

Ans 02.



Orbital picture of ethene depicting -bonds

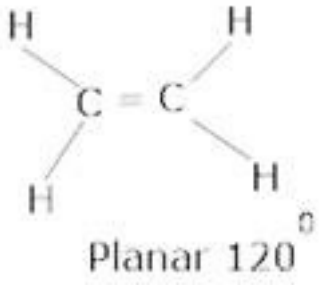
Ans 03. Geometrical isomerism in alkenes is due to the lack of free rotation of the doubly bonded carbon atoms due to the presence of double bond between them.

Ans 04. (a) 5 – methyl – hept – 1, 3, 6 triene

(b) 3 – methyl – penta – 4, - en – 1 yne.

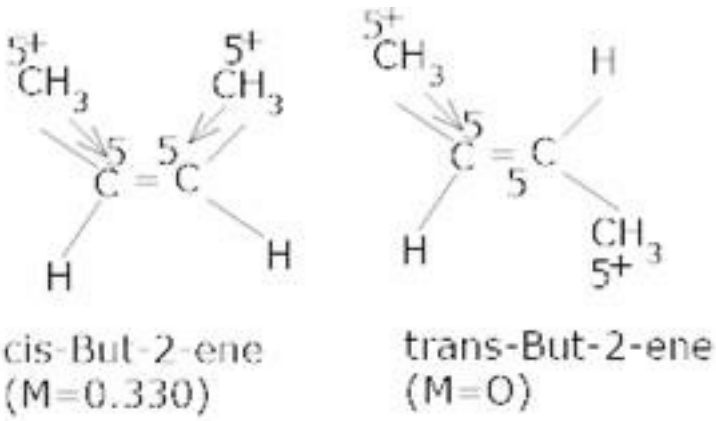
Ans 05. 2 – Butene

Ans 06.



Ans 07. The repulsion between the same group on the same side is more in cis – form than trans – form therefore their physical properties are different.

Ans 08.



cis-But-2-ene
(M=0.330)

trans-But-2-ene
(M=O)

In the trans – but – 2-ene, the two methyl groups are in opposite directions. Therefore, dipole moments of H_3C-CH_3 bonds cancel, thus making the trans form non-polar.

Ans 09. Because two different groups are attached to one of the doubly bonded carbon atom.

Ans 10. The restricted rotation of atoms or groups around the doubly bonded carbon atoms gives rise to different geometries of such compounds. The stereo isomers of this type are called geometrical isomers.