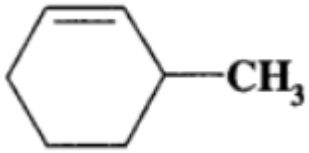
INDIAN SCHOOL AL WADI AL KABIR		
Class: XI	**Department: SCIENCE (CHEMISTRY)**	**Date: 28/10/23**
Worksheet No.: 06	**Topic:** **Organic Chemistry-Some basic principles and techniques**	**Note: A4 FILE FORMAT**
NAME OF THE STUDENT:	**CLASS & SEC:**	**ROLL NO.**

I. MULTIPLE CHOICE QUESTIONS (1 MARK)

1. The I.U.P.A.C. name of $CH_3COCH(CH_3)_2$ is:
(a) 3-methyl-2-butanone
(b) Isopropyl methyl ketone
(c) 2-methyl-3-butanone
(d) 4-methyl isopropyl ketone

2. The I.U.P.A.C. name of

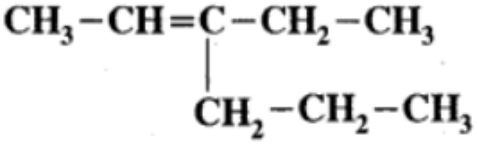


(a) 3-Methylcyclohexene
(b) 1-methylcylohex-2-ene.
(c) 6-methylcyclohexene
(d) 1-methylcyclohex-5-ene.

3. The C-H bond distance is longest in
(a) C_2H_2
(b) C_2H_4
(c) C_2H_6
(d) $C_2H_2Br_2$

4. Which of the following is an electrophile?
(a) H_2O
(b) NH_3
(c) $AlCl_3$
(d) $C_2H_5NH_2$

5.The I.U.P.A.C. name of the following compound is



(a) 3-Ethylhex-2-ene

(b) 3-Propylhex-2-ene
(c) 3-Proplhex-3-ene
(d) 4-Ethylhex-4-ene

6. The I.U.P.A.C. name of $CH_3 – CH = CH\ COO\ C_2H_5$ is
(a) Ethyl but-1 -enoate
(b) Ethyl but-2-enoate
(c) Ethyl prop-2-enoate
(d) None of these

7. CH_3CH_2Cl undergoes homolytic fission to produce
(a) $CH_3CH_2^{\bullet}$ & $Cl^{\bullet}$
(b) $CH_3CH_2^{+}$ & Cl^{-}
(c) $CH_3CH_2^{+}$ & $Cl^{\bullet}$
(d) $CH_3CH_2^{\bullet}$ & Cl^{-}

II. ASSERTION REASON TYPE QUESTIONS (I MARK)

For the following questions, two statements are given- one labelled *Assertion* (A) and theother labelled *Reason* (R). Select the correct answer to these questions from the codes (i),(ii), (iii) and (iv) as given below

(a) Both A and R are true and R is the correct explanation of the assertion.
(b) Both A and R are true but R is not the correct explanation of the assertion.
(c) A is true but R is false.
(d) A is false but R is true.

8. Assertion (A). Simple distillation can help in separating a mixture of propan -1-ol (boiling point 97°C) and propanone (boiling point 56°C)
Reason (R). Liquids with a difference of more than 20°C in their boiling points can be separated by simple distillation.

9. Assertion (A). Pent-1-ene and pent-2-ene are position isomers.
Reason (R). Position isomers differ in the position of functional group or a substituent.

10. Assertion (A). All the carbon atom in $H_2C=C=CH_2$ are sp^2-hybridised.
Reason (R). In this molecule all the carbon atoms are attached to each other by double bonds.

III. 2 MARKS QUESTIONS

11. Explain why alkyl groups act as electron donors when attached to a π system.
12. Explain, how is the electronegativity of carbon atoms related to their state of hybridization in an organic compound?
13. What are electrophiles and nucleophiles? Explain with examples.

IV 3 MARKS QUESTIONS

14. If a liquid compound decomposes at its boiling point, which method can you choose for its purification? It is known that the compound is stable at low pressure, steam volatile and insoluble in water. Give reason.
15. Write structural formulae for compounds named as-
    (a) 1-Bromoheptane
    (b) 5-Bromoheptanoic acid
16. Give three points of differences between inductive effect and resonance effect.

V 5 MARKS QUESTIONS

17. A liquid with a high boiling point decomposes on simple distillation but it can be steam distilled for its purification. Explain how is it possible?
18. Explain hyperconjugation effect. How does hyperconjugation effect explain the stability of alkenes?
19. (a) What is isomerism?
    (b) Give two examples of structural isomers.
    (c) Draw the structural formula of each compound.

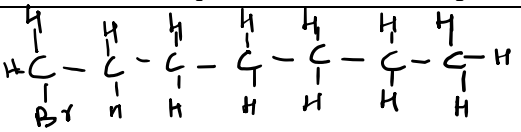
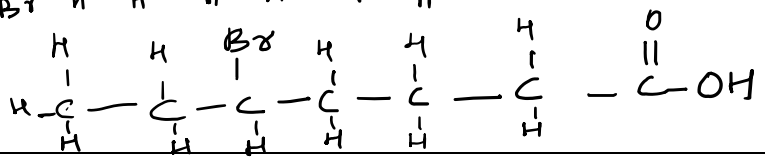
VI PASSAGE BASED /CASE STUDY BASED QUESTIONS

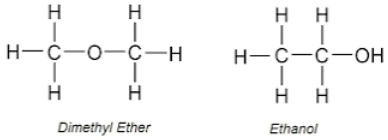
20. Read the given passage and answer the questions that follow:

The movement of electrons in organic reactions can be shown by curved-arrow notation. It shows how changes in bonding occur due to electronic redistribution during the reaction. To show the change in position of a pair of electrons, curved arrow starts from the point from where an electron pair is shifted and it ends at a location to which the pair of electrons may move.

a. Define inductive effect.
b. Which of the following is a temporary effect?
   Electromeric effect or Hyperconjugation effect
c. Differentiate between positive electrometric effect and negative electrometric effect.

Q. No.	ANSWERS
1	(a) 3-methyl-2-butanone
2	a) 3-Methylcyclohexene
3	(c) C_2H_6

4	(c) $AlCl_3$
5	a) 3-Ethylhex-2-ene
6	(b) Ethyl but-2-enoate
7	(a) $CH_3\dot{C}H_2$ & $Cl\bullet$
8	(a) Both A and R are true and R is the correct explanation of the assertion.
9.	(a) Both A and R are true and R is the correct explanation of the assertion.
10.	(d) A is false but R is true.
11.	Due to hyperconjugation, the alkyl groups act as electron donors when attached to a π system. Due to hyperconjugation, the pi electrons are delocalized. The delocalization is due to partial overlap of sp^3 sigma bond orbital with an empty p orbital of the pi bond of adjacent C atom. This increases the stability of molecule.
. 12.	The change in hybridisation affects the electronegativity of carbon. The greater the s character of the hybrid orbitals, the greater is the electronegativity. Thus, a carbon atom having a sp hybrid orbital with 50% s character is more electronegative than that possessing sp2 or sp3 hybridised orbitals.
. 13	Electrophiles are electron deficient species and can accept an electron pair from electron rich species. Examples include carbocations and carbonyl compounds. A nucleophile is electron rich species and donates electron pairs to electron deficient species. Examples include carbanions, water, ammonia, cyanide ion etc.
. 14	As the given compound is steam volatile, insoluble in water and decomposes at its boiling point steam distillation techniques can be used for purification.
. 15	(a)  (a) 
. 16	Inductive Effect • In inductive effect only partial polarisation of sigma bond occur due to electronegativity difference due to which partial positive and partial negative charge develops. • It is a distance dependent effect. • Inductive effect is affected by the electronegativity values of the atoms Resonance Effect • In resonance effect there is a complete displacement of π-bond or nonbonding electron pair from one part of the conjugated system to the other part due to which complete positive and negative charge develops. • It is a distance independent effect. • The resonance effect is affected by conjugation.
. 17	Steam distillation is a special type of separation process for temperature sensitive materials like natural organic compounds. Some organic compounds tend to decompose at higher temperature and normal distillation does not suit this purpose. So, steam/water is added to the apparatus and the temperature of the compounds are depressed,

	evaporating them at lower temperature. Once the distillation is accomplishing, the vapours are condensed and hence there is the separation of the constituents at ease.
. 18	Hyperconjugation allows adjacent -R groups (mostly C-C and C-H σ-bonds) to create shared molecular orbitals with π-bonds, stabilizing the bond. the more –R groups attached to the double bond, the more stable the double bond will be.
. 19	(a) The existence of two or more compounds having the same molecular formula but different properties. (b) Ethanol and Methoxymethane  Dimethyl Ether Ethanol (c)
20	a. The inductive effect refers to the phenomenon wherein a permanent dipole arises in a given molecule due to the unequal sharing of the bonding electrons in the molecule. b. Electromeric effect c. The positive electromeric effect occurs when the shared electron pair is transferred towards the attacking reagent. A negative electromeric effect is observed when the shared pair of electrons is transferred away from the attacking reagent.

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