


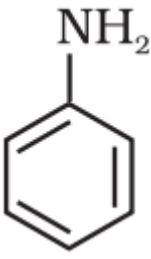

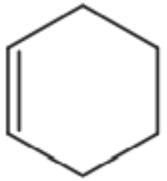


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|  | <b>INDIAN SCHOOL AL WADI AL KABIR</b>  |  |
| <b>Class: XI</b>  | <b>DEPARTMENT: SCIENCE 2022-23</b><br><b>SUBJECT: CHEMISTRY</b>                  | <b>Date of completion:</b><br><b>III week of November, 2022</b>                     |
| <b>Worksheet No:06</b><br><b>with answers</b>                                     | <b>TOPIC: ORGANIC CHEMISTRY – SOME</b><br><b>BASIC PRINCIPLES AND TECHNIQUES</b> | <b>Note:</b><br><b>A4 FILE FORMAT</b>   |
| <b>NAME OF THE STUDENT</b>  | <b>CLASS &amp; SEC:</b>  | <b>ROLL NO.</b>   |

### MULTIPLE CHOICE QUESTIONS

- IUPAC name of  $\text{CH}_3\text{CH}(\text{OH})\text{CH}_2\text{CH}_2\text{CH}=\text{CH}_2$  is .....
  - Hex-1-en-5-ol
  - Hex-2-en-6-ol
  - 2-Hydroxyhex-5-ene
  - Hex-5-en-2-ol
- What is the type of hybridisation of each carbon in  $\text{CH}_3\text{CN}$ ?
  - $\text{sp}^3$ , sp
  - $\text{sp}^2$ , sp
  - $\text{sp}^3$ ,  $\text{sp}^2$
  - Only  $\text{sp}^3$
- Which of the following is a heterocyclic aromatic compound?
  - 
  - 
  - 
  - 





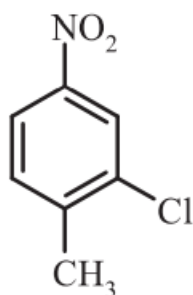
16. Assertion:  $\text{NH}_4\text{Cl}$  can be separated from  $\text{NaCl}$  by sublimation.

Reason: Both  $\text{NH}_4\text{Cl}$  and  $\text{NaCl}$  are sublimable compounds.

- Both assertion and reason are correct statements, and reason is the correct explanation of the assertion.
- Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion.
- Assertion is correct, but reason is wrong statement.
- Assertion is wrong, but reason is correct statement.

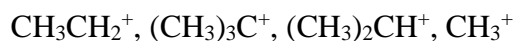
**Question – Answer Type:**

17. Write the IUPAC name of the following compound. 1



18. Define Hyperconjugation. 1

19. Arrange the following carbocation in the increasing order of stability. 1



20. Kjeldahl method is not applicable to compounds containing nitrogen in nitro and azo groups and nitrogen present in the ring. Why? 1

21. Differentiate between Nucleophiles and Electrophiles with one example each. 2

22. Describe the method of column chromatography. 2


23. Draw the resonance structures of Aniline. 2

24. Describe the qualitative analysis of Nitrogen and Sulphur. 3

25. Explain the quantitative analysis of: 3

- Dumas method for Nitrogen
- Carius method for Halogen

## ANSWERS

|     |   |
|-----|---|
| 1.  | d) Hex-5-en-2-ol  |
| 2.  | a) $sp^3$ , $sp$  |
| 3.  | a)   |
| 4.  | b) trigonal planar  |
| 5.  | b) $\begin{array}{c} \text{CH}_3\text{-CH-CH}_2\text{-} \\   \\ \text{CH}_3 \end{array}$  |
| 6.  | c) Aldehyde > Ketone > Amine  |
| 7.  | b) Chain isomers  |
| 8.  | c) $\dot{\text{C}}(\text{CH}_3)_3$  |
| 9.  | a) electrophile   |
| 10. | c) -CHO   |
| 11. | Polarisation of $\sigma$ - bond caused by the polarisation of adjacent $\sigma$ -bond is called inductive effect.   |
| 12. | Electromeric Effect   |
| 13. | In positive electromeric effect, the $\pi$ -electrons of the multiple bond are transferred to that atom to which the reagent gets attached.<br><br>In negative electromeric effect, the $\pi$ - electrons of the multiple bond are transferred to that atom to which the attacking reagent does not get attached. |
| 14. | a) Both assertion and reason are correct statements, and reason is the correct explanation of the assertion.  |
| 15. | c) Assertion is correct, but reason is wrong statement.   |
| 16. | c) Assertion is correct, but reason is wrong statement.   |
| 17. | 2-Chloro-1-methyl-4-nitrobenzene  |
| 18. | Hyperconjugation involves delocalisation of $\sigma$ electrons of C—H bond of an alkyl group directly attached to an atom of unsaturated system or to an atom with an unshared p orbital.   |
| 19. | $\text{CH}_3^+ < \text{CH}_3\text{CH}_2^+ < (\text{CH}_3)_2\text{CH}^+ < (\text{CH}_3)_3\text{C}^+$   |
| 20. | This is because nitrogen in nitro and azo groups and nitrogen present in the ring does not change to ammonium sulphate.   |
| 21. | A reagent that brings an electron pair to the reactive site is called a nucleophile.<br>Eg: - $\text{OH}^-$ , $\text{NH}_3$<br><br>A reagent that takes away an electron pair from reactive site is called electrophile.<br>Eg: - $\text{H}^+$ , $\text{BF}_3$  |

|     |   |
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| 22. | <p>Column chromatography involves separation of a mixture over a column of adsorbent (stationary phase) packed in a glass tube. The mixture is placed on the top of the adsorbent column packed in a glass tube. An appropriate eluent, which is a liquid, is allowed to flow down the column slowly. Depending upon the degree to which the compounds are adsorbed, complete separation takes place. The most readily adsorbed substances are retained near the top and others come down to various distances in the column.</p>   |
| 23. |   |
| 24. | <p><b><u>Nitrogen</u></b></p> <p><u>Experiment</u></p> <p>The sodium fusion extract is boiled with iron (II) sulphate and then acidified with conc. <math>\text{H}_2\text{SO}_4</math></p> <p><u>Observation</u></p> <p>Prussian blue colour</p> $6\text{CN}^- + \text{Fe}^{2+} \rightarrow [\text{Fe}(\text{CN})_6]^{4-}$ $3[\text{Fe}(\text{CN})_6]^{4-} + 4\text{Fe}^{3+} \xrightarrow{x\text{H}_2\text{O}} \text{Fe}_4[\text{Fe}(\text{CN})_6]_3 \cdot x\text{H}_2\text{O}$ <p style="text-align: center;">Prussian blue</p> <p><b><u>Sulphur</u></b></p> <p><u>Experiment</u></p> <p>The sodium fusion extract is acidified with acetic acid and lead acetate is added to it.</p> <p><u>Observation</u></p> <p>A black precipitate.</p> $\text{S}^{2-} + \text{Pb}^{2+} \longrightarrow \text{PbS}$ <p style="text-align: center;">Black</p> |
| 25. | <p>a) <u>Dumas method for Nitrogen</u></p> <p>The nitrogen containing organic compound, when heated with copper oxide in an atmosphere of carbon dioxide, yields free nitrogen in addition to carbon dioxide and water. Traces of nitrogen oxides formed are reduced to nitrogen by passing the gaseous mixture over heated copper gauze. The mixture of gases so produced is collected over an aqueous solution of potassium hydroxide which absorbs carbon dioxide. Nitrogen is collected in the upper part of the graduated tube.</p> $\text{Percentage of nitrogen} = \frac{28 \times V \times 100}{22400 \times m}$  |

b) Carius method for Halogen

A known mass of an organic compound is heated with fuming nitric acid in the presence of silver nitrate contained in a hard glass tube known as Carius tube. Carbon and hydrogen present in the compound are oxidised to carbon dioxide and water. The halogen present forms the corresponding silver halide (AgX). It is filtered, washed, dried and weighed.

Percentage of halogen

$$= \frac{\text{atomic mass of X} \times m_1 \times 100}{\text{molecular mass of AgX} \times m}$$

PREPARED BY MR. ANOOP STEPHEN

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