

Q-13- Identify the electron deficient compound among the following:

- (a) NH_3 (b) H_2O (c) BCl_3 (d) CH_4



Q-14- Alicyclic compounds are _____.

- (a) Heterocyclic compounds (b) Aliphatic compounds
(c) Aromatic compounds (d) None of these

Q-15- Which of the following has neither secondary nor tertiary hydrogen?

- (a) Isopentane (b) Pentane (c) Iso-butane (d) Neo-pentane

M.S.M.S.



COMPETENCY BASED QUESTIONS

(Assertion-Reasoning)

Direction : In each of the following questions, a statement of Assertion (A) is given followed by a corresponding statement of Reason (R). Select the most appropriate answer from the options given below:

- (a) Both Assertion (A) and Reason (R) are true and Reason is the correct explanation of Assertion.
- (b) Both Assertion and reason are true, but Reason is not the correct explanation of Assertion.
- (c) Assertion is true but Reason is false.
- (d) Assertion is false but Reason is true.

Q-1- **Assertion (A):** Pent-1-ene and pent-2-ene are position isomers.

Reason (R): Position isomers differ in the position of functional group or substituent.

Q-2- **Assertion (A):** 3° free radical is most stable.

Reason (R): It is due to $-I$ effect of alkyl groups.

Q-3- **Assertion (A):** IUPAC name of $\text{ICH}_2\text{CH}_2\text{CH}_2 - \text{COOH}$ is 4-iodobutanoic acid.

Reason (R): Iodine is preferred over $- \text{COOH}$ in IUPAC system.

Q-4- **Assertion (A):** $3^{\circ} > 2^{\circ} > 1^{\circ}$ is order of stability of carbocation.

Reason (R): It is due to $+I$ effect and hyper conjugation.

Q-5- **Assertion (A):** But-1-ene and 2-methyl propene are position isomers.

Reason (R): Position isomers differ in position of functional group.

Q-6- **Assertion (A):** Butane and 2-methyl butane are homologous.

Reason (R): Butane is straight chain, 2-methyl butane is branched chain.

Q-7- **Assertion (A):** Carbocations are plane.

Reason (R): Carbocations are sp^2 hybridised.

Q-8- **Assertion (A):** The IUPAC name of $\text{CH}_3 - \text{CH} = \text{CH} - \text{CHO}$ is but-2-enal.

Reason (R): Functional group gets preferred over double bond (multiple bond).

Q-9- **Assertion (A):** $\text{Br} - \text{CH}_2 - \text{CH} = \text{CH} - \text{CH}_2\text{Cl}$ is 1-bromo-4-chloro-but-2-ene.

Reason (R): Halogens are preferred alphabetically if equidistant.

Q-10- **Assertion (A):** $\text{CH}_2 \equiv \text{CH} - \text{CH}_2\text{CH}_2\text{OH}$ is but-3-en-1-ol.

Reason (R): Double bond is preferred over $- \text{OH}$ group.

Q-11- **Assertion (A):** $\text{C}_7\text{H}_8\text{O}$ has five isomers having benzene ring.

Reason (R): Ethers show metamerism.



Q-12- **Assertion (A):** $\begin{array}{c} \text{O} \\ || \\ -\text{C}-\text{H} \end{array}$ group is electron withdrawing and m-directing towards electrophilic substitution reaction (ESR).

Reason (R): -Cl is electron withdrawing but still o and p-directing towards ESR due to +R effect.

MSMS



Mahavir Senior Model School
Subject : Chemistry
Class : XI-C
Topics : Organic Chemistry and Hydrocarbons

COMPETENCY BASED QUESTIONS

(Case Based)

Q-1- Read the given passage and answer the questions that follow:

Hydrocarbons are compounds of carbon and hydrogen only, obtained from coal and petroleum mainly which are major sources of energy. Hydrocarbons are classified as open chain saturated (alkanes), unsaturated (alkenes and alkynes), cyclic (alicyclic) and aromatic based on structure. Alkanes show conformational isomerism due to free rotation along C – C bond leading to staggered and eclipsed confirmations of ethane. Staggered confirmation is more stable. Alkenes show geometrical (Cis-trans) isomerism due to restricted rotation around carbon-carbon double bond. Benzene and benzenoid show aromatic character. They follow Huckel rule $(4n + 2) \pi$ electrons which must be delocalized. The presence of activating and deactivating groups decide the position of electrophile after electrophilic substitution. Polynuclear fused aromatic hydrocarbons have carcinogenic property. Benzene is prepared by polymerization of ethyne and by heating sodium benzoate with soda lime.

- (i) Why is staggered form of ethane more stable than eclipsed form?
- (ii) Out of 1-butene and 2-butene which will show geometrical isomerism?
- (iii) Why is cis-2-butene has higher boiling point than trans-2-butene?
- (iv) Why is cyclopentadienyl anion is aromatic?
- (v) Why is – NO₂ group m-directing towards electrophilic substitution?
- (vi) Convert acetylene to benzene.
- (vii) Sodium benzoate, on heating with soda lime gives benzene, name the reaction.
- (viii) Explain why n-pentane has higher boiling point than neo-pentane.
- (ix) Give the IUPAC name of acetylene.
- (x) How many Secondary Carbons are there in 2,2-diethyl butane.

Q-2- Read the given passage and answer the questions that follow:

Organic compounds are formed by covalent bonding. The nature of covalent bonding can be described with the help of hybridization, sp, sp² and sp³. The structure and reactivity depends upon type of bonds present in organic compounds. Organic compound can be represented by various structural formulae. Wedge and Dash formula is 3-D representation. Organic compounds can be classified on the basis of functional groups. Organic reactions mechanism are based on structure of substrate and the attacking reagent.

