

## CHEMISTRY-1

## Basic concepts of Organic Chemistry

## [Set-1]

## SECTION-A

1. Which of the following two represent the chain isomers?
- (i)  $(\text{CH}_3)_2\text{CHOH}$  and  $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$
- (ii)  $\text{CH}_3\text{OCH}_2\text{CH}_3$  and  $\text{CH}_3\text{COCH}_3$
- (iii)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{OCH}_3$  and  $\text{CH}_3-\underset{\text{CH}_3}{\text{CH}}-\text{OCH}_3$
- (iv)  $\text{CH}_3-\underset{\text{CH}_3}{\text{CH}}-\text{CHO}$  and  $\text{CH}_3-\text{CH}_2\text{CH}_2\text{CHO}$
2. The maximum number of secondary hydrogens present in
- (i) 2-Methyl pentane (ii) 2,3-Dimethyl pentane
- (iii) 3-Methyl hexane (iv) 2,2-Dimethyl propane
3. The least stable structure is
- (i)  $\text{CH}_3-\overset{+}{\text{C}}=\ddot{\text{O}}:$  (ii)  $\overset{-}{\text{C}}\text{H}_2-\text{C}=\overset{+}{\text{Cl}}:$  (iii)  $\text{CH}_3-\text{C}\equiv\overset{+}{\text{O}}:$  (iv)  $\text{CH}_2=\text{CH}-\text{Cl}$
4. Buta-1,2-diene contains
- (i) only  $\text{sp}^2$  carbon (ii)  $\text{sp}$  and  $\text{sp}^2$  carbon (iii)  $\text{sp}$ ,  $\text{sp}^2$  and  $\text{sp}^3$  carbon (iv) only  $\text{sp}$  carbon

## 5. Match the following:

## Column-I

- A. Free radical  
B. Carbocation  
C. Carbanion

## Column-II

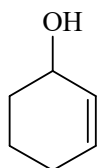
1. Trigonal planar  
2. Trigonal pyramidal  
3. Linear

	A	B	C
(i)	1	1	2
(ii)	1	2	3
(iii)	2	3	1
(iv)	3	1	2



## SECTION-B

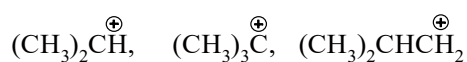
11. (i) Write IUPAC name of the following compound



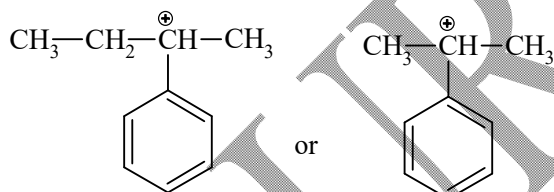
- (ii) Draw the structure of the isobutyl alcohol.
12. (i) What is the ratio of the number of primary carbon atoms to the number of secondary hydrogen atoms in 2,2-Dimethyl pentane.
- (ii) Draw the functional isomer of ethyl alcohol. Also, write IUPAC name of the isomer.

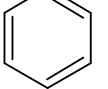
OR

- (i) Arrange in order of increasing stability

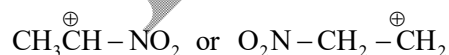


- (ii) Which one is more stable and why?



13. Draw resonance structures of phenol,  using curved arrows, showing correct position of positive and negative charges.

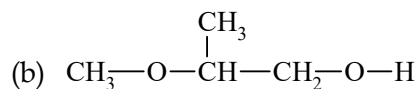
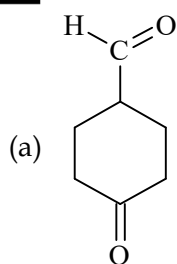
14. (i) Which one is less stable and why?



- (ii) Why is the conjugate base of methane more stable than conjugate base of ethane?

OR

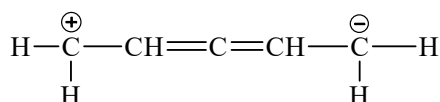
- (i) Identify the functional group and also name the functional group in the following compounds



(ii) What do you understand by metamerism?

15. (i) Draw the chain isomer of butanal  
 (ii) Draw the position isomer of methoxy propane  
 (iii) Draw the bond line structure of  
 4-Hydroxy hex-2-enoic acid

(iv) Label each carbon atom as  $sp$ ,  $sp^2$  and  $sp^3$



OR

- (i) Draw  
 (a) the metamer of pentan-3-one  
 (b) the position isomer of pentan-3-one  
 (c) the chain isomer of butanoic acid
- (ii) Draw the bond line structure and structural formula of  
 3-Bromo-2-hydroxy-heptanal