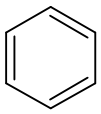
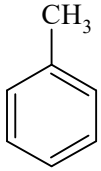
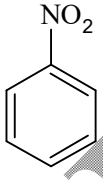
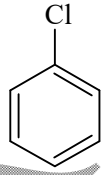
CHEMISTRY-2

Hydrocarbons

[Set-2]

SECTION-A

1. Which of the following can be nitrated most easily?

(i)  (ii)  (iii)  (iv) 

2. Hydration of ethyne to ethanal takes place through 'X'. What 'X' is ?

$$HC{\equiv}CH \xrightarrow{\text{dil. } H_2SO_4} \text{'X'} \xrightarrow{\text{Heat}} CH_3CHO$$

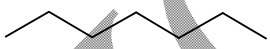
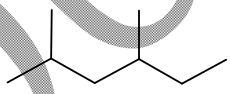
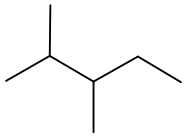
(i) $CH_3CH(OH)_2$ (ii) $CH_3 = CH - OH$ (iii) $CH_2 = CHO^-$ (iv) $CH \equiv C^-$

3. One mole of alkene on reductive ozonolysis gives one mole of acetaldehyde and one mole of acetone. The IUPAC name of the alkene is

(i) 2-Methyl but-2-ene (ii) 2-Methyl but-1-ene

(iii) But-2-ene (iv) 2-Methyl pent-2-ene

4. The decreasing order of boiling point is

I.  II.  II. 

(i) I > II > III (ii) II > III > I (iii) II > I > III (iv) I > III > II

5. **Match the following:**

	Column-I		**Column-II**
A.	But-1-ene	1.	CH_3CHO
B.	But-2-ene	2.	$CH_2(CHO)-CH_2(CHO)$
C.	2-Methyl propene	3.	$CH_3 - CH_2CHO$, HCHO
D.	Cyclobutene	4.	CH_3COCH_3, HCHO

	A	B	C	D
(i)	3	4	2	1
(ii)	4	2	1	3
(iii)	2	3	1	4
(iv)	3	1	4	2

Assertion-Reason type Questions:

(a) Both A and R are true and R is the correct explanation of A

(b) Both A and R are true and R is not the correct explanation of A

(c) A is true but R is false

(d) A is false but R is true

6. A: Benzene and ethene both decolourises bromine.

   R: Benzene and ethene both are planar unsaturated molecules.

7. A: Butan-1-ol on acid-catalysed dehydration gives but-2-ene as major product

   R: Secondary carbocation is more stable than primary carbocation

Passage based questions:

Benzene undergo electrophilic substitution reactions to give monosubstitution benzene. When monosubstituted benzene is subjected to further substitution, three possible disubstituted products are not formed in equal amounts. Two types of behavior are observed. Either ortho and para products or meta product is predominantly formed.

It has also been observed that this behavior depends on the nature of the substituent already present in the benzene ring and not an the nature of the incoming group. This is known as directive influence of substituents. If the atom directly bonded to benzene has atleast one lone pair of electron present, then it exerts ortho/para directing effect. If atom directly bonded to benzene is multiple bonded to more electronegative atom, then group is meta directing.

8. Which of the following group exerts a meta directing effect?

   (i) $-NO_2$ (ii) $-OH$ (iii) $-NH_2$ (iv) $-NHCOCH_3$

9. Nitration of chlorobenzene gives

   (i) Only ortho nitrochlorobenzene

   (ii) only para nitrohclorbenzene

   (iii) only meta nitrochlorobenzene

   (iv) a mixture of ortho and para nitrochlorobenzene

10. Bromination of nitrobenzene gives m-Bromonitro benzene because

(i) meta position is more electron rich

(ii) ortho and para position are positively charged

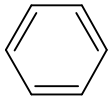
(iii) meta position is carrying a positive charge

(iv) nitro group is m-directing

SECTION-B

11. Complete the following

(i) $CH_3CH_2COO^-K^+ + H_2O \xrightarrow{\text{electrolysis}}$

(ii)  $+ HNO_3 \xrightarrow{H_2SO_4}$

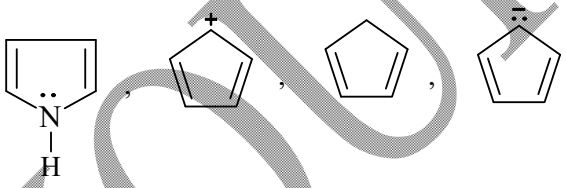
12. Account for the following:

(i) n-pentane has a higher boiling point than neopentane

(ii) Addition of HBr to but-2-ene gives the same product in the absence or presence of peroxide.

OR

(i) Which of the following are non-aromatic and why?



(ii) An hydrous conditions are required to perform a reaction between chloroethane and sodium. Why?

13. Explain the following:

(i) Peroxide effect

(ii) Wurtz reaction

OR

What are the structures and IUPAC names of compounds A, B and C?

$$\text{n-Hexane} \xrightarrow[\text{770 K, high pressure}]{\text{Pb}} A \xrightarrow[\text{light}]{Cl_2} B \xrightarrow[\text{Heat}]{KOH/C_2H_5OH} C$$

14. An alkane A(C_5H_{12}) on reaction with chlorine in the presence of bright sunlight gives only one monochloro product B.

    (i) What are the structure of A and B? Write their IUPAC names also

    (ii) Draw an isomer of A which gives four monochloro products on reaction with Cl_2/light.

15. (i) Explain the mechanism of chlorination of benzene using $Cl_2/FeCl_3$

    (ii) Convert

    (a) benzene into benzene sulphonic acid

    (b) ethyne into propyne

    (c) benzene into m-chloronitrobenzene

OR

(i) Explain Friedel-Craft acetylation

(ii) How will you make the following conversions?

(a) Propene into 1-bromopropane

(b) Benzene into hexachlorobenzene

(c) Chloroethane into n-butane

