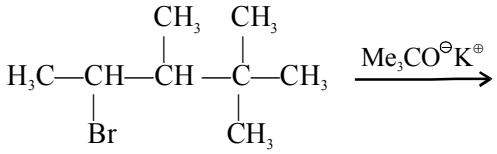
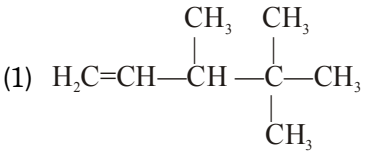
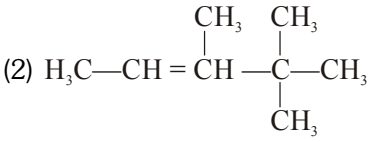
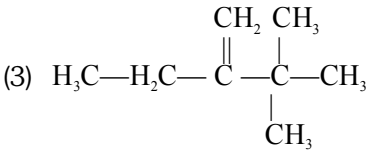
1. What is the major product of the following reaction:



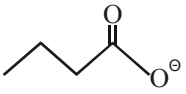
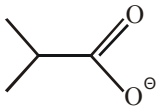
(1) 

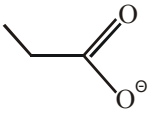
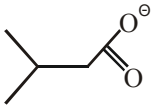
(2) 

(3) 

(4) None of these

2. Which of the following anion will be migrates towards anode to prepare 2,3–Dimethyl butane in kolbe's electrolysis :-

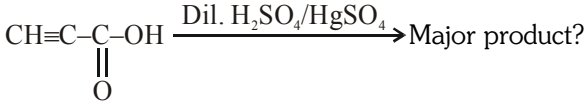
(1)  (2) 

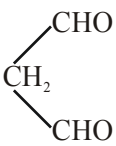
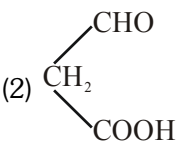
(3)  (4) 

3. Which of the following reagent can not used to distinguish but–1–yne and but–2–yne :-

(1) $[Cu(NH_3)_2]^{\oplus}$ (2) NaOH

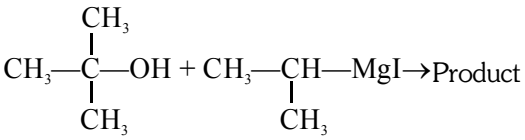
(3) $[Ag(NH_3)_2]^{\oplus}$ (4) Cold–Dil–$KMnO_4$

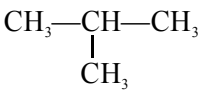
4. 

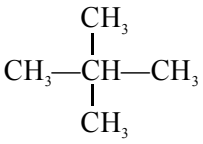
(1)  (2) 

(3) $CH \equiv C - CH_3$ (4) $CH_2 = CH - COOH$

5. What is product of following reaction :-

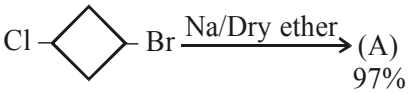


(1) 

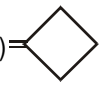
(2) 

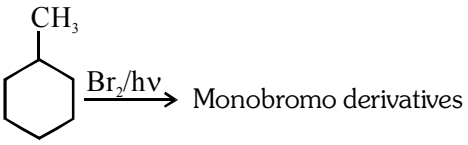
(3) $CH_3—CH_2—CH_3$

(4) CH_4

6. 

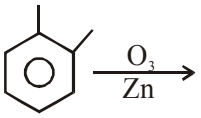
Product (A) of above reaction is :

(1)  (2)  (3)  (4) 

7. 

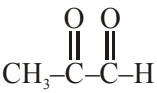
The number of possible monobromo products is (excluding stereoisomers) :

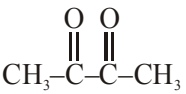
(1) 4 (2) 5 (3) 8 (4) 10

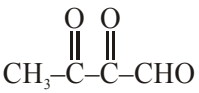
8. 

Which of the following products cannot be obtained in ozonolysis of o-xylene ?

(1) 

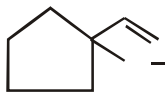
(2) 

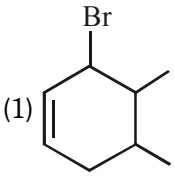
(3) 

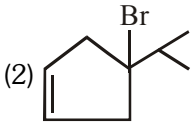
(4) 

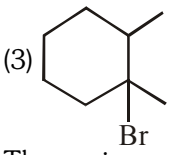
9. $\begin{matrix}CH_2–CO_2K\\ |\\ CH_2–CO_2K\end{matrix} \xrightarrow{\text{electrolysis}} \underset{\text{major}}{(A)}$

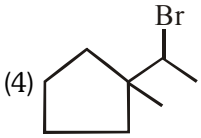
(Kolbe electrolysis method)
Product (A) of the reaction is :-
(1) $CH_3 – CH_3$
(2) $CH_2 = CH_2$
(3) $CH_3 – CH = CH_2$
(4) None of these

10.  $\xrightarrow[CCl_4]{HBr} \underset{\text{major}}{A}$ Product (A) is :-

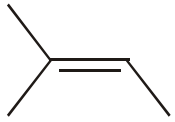
(1) 

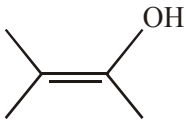
(2) 

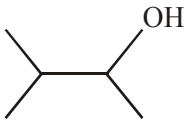
(3) 

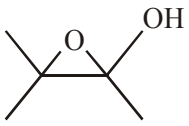
(4) 

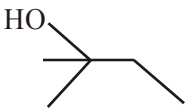
11. The major product of the following reaction sequence is :-

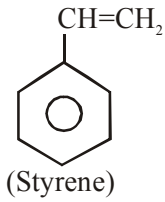
 $\xrightarrow[2.\ H_2O_6,\ HO]{1.\ B_2H_6} ?$

(1) 

(2) 

(3) 

(4) 

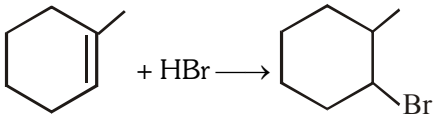
12. 
(Styrene)

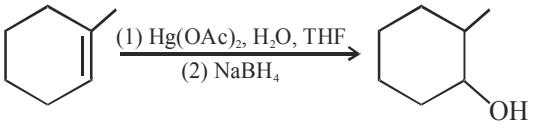
$\xrightarrow[CCl_4]{Br_2} (A) \xrightarrow[(ii)\ NaNH_2]{(i)\ alc.\ KOH} (B)$

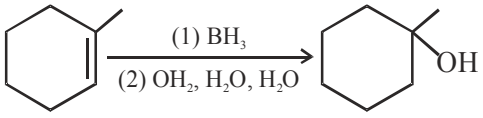
$\xrightarrow[(ii)\ CH_3–Cl]{(i)\ NaNH_2} (C)$

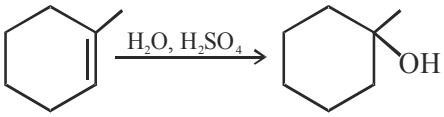
Product (C) is:-
(1) $Ph – C \equiv CNa$
(2) $Ph–CH_2–C \equiv CH$
(3) $Ph –C \equiv C– CH_3$
(4) $Ph – CH = C = CH_2$

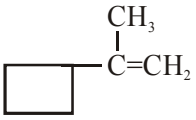
13. Which of the following reactions generates the major product ?

(1) 

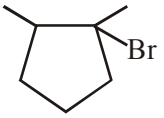
(2) 

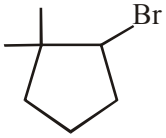
(3) 

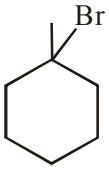
(4) 

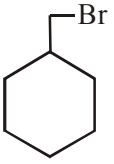
14.  $+ HBr \longrightarrow \underset{\text{(Major)}}{A}$

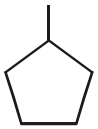
Product (A) is :-

(1) 

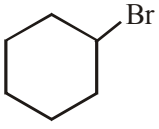
(2) 

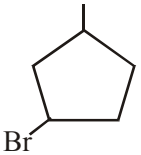
(3) 

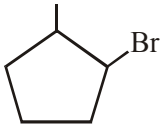
(4) 

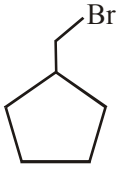
15.  $\xrightarrow{Br_2/hv}$ Major (X) $\xrightarrow[KOH/\Delta]{\text{Alcoholic}}$ Major(Y)

$\xrightarrow[\text{Peroxide}]{H\text{-}Br}$ Major(Z) :-

(1) 

(2) 

(3) 

(4) 

16. $CH_3–C\equiv C–H \xrightarrow{NaNH_2} \xrightarrow{Ca_3–1} \xrightarrow{Li/liq.\ NH_3} (B)$ and $\xrightarrow[Pd\text{-}CaCO_3]{H_2} (C)$

Relation between (B) and (C) is

(1) Enantiomer (2) Diastereomer

(3) Optical isomers (4) Meso

17. In the given reaction :

$$\begin{matrix}CH_3\\CH_3\end{matrix}\!\!>\!C = CH–CH_3 \xrightarrow[(ii)\ NaBH_4]{(i)\ Hg(OAc)_2/CH_3OH} [X] \ ,$$

will be :-

(1) $CH_3–\underset{\displaystyle CH_3}{\overset{\displaystyle OCH_3}{\underset{|}{\overset{|}{C}}}}–CH_2–CH_3$

(2) $CH_3–\underset{\displaystyle CH_3}{\underset{|}{CH}}–\overset{\displaystyle OCH_3}{\overset{|}{CH}}–CH_3$

(3) $CH_3–\underset{\displaystyle CH_3}{\overset{\displaystyle OH}{\underset{|}{\overset{|}{C}}}}–CH_2–CH_3$

(4) $CH_3–\underset{\displaystyle CH_3}{\overset{\displaystyle O}{\underset{|}{\overset{\|}{C}}}}–CH_2–CH_3$

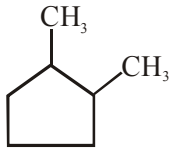
18. Which of the following cannot be considered as a mechanistic step in chain reaction of methane with Cl_2 :-

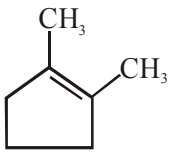
(1) $Cl_2 \longrightarrow Cl^{\bullet}$

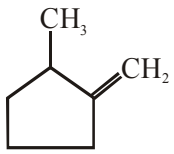
(2) $CH_4 + Cl^{\bullet} \longrightarrow CH_3Cl + H^{\bullet}$

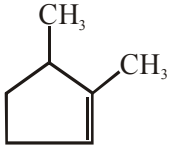
(3) $Cl^{\bullet} + CH_4 \longrightarrow CH_3^{*} + HCl$

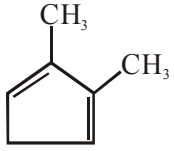
(4) $Cl^{\bullet} + CH^{\bullet}_3 \longrightarrow CH_3Cl$

19.  $\xrightarrow{Br_2/hv} \xrightarrow{alc.KOH}$ (X):-

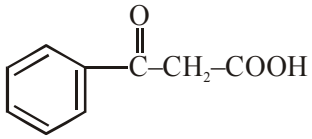
(1) 

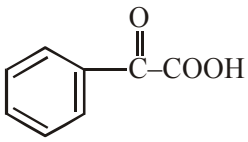
(2) 

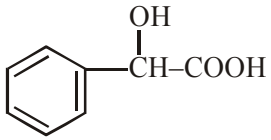
(3) 

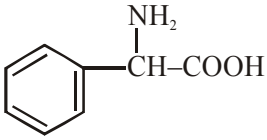
(4) 

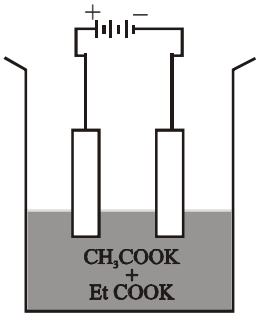
20. Which of the following carboxylic acids undergoes decarboxylation most easily :-

(1) 

(2) 

(3) 

(4) 

21. 

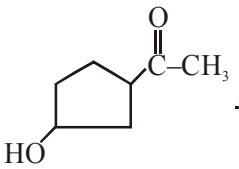
Which of the gases evolved on the surface of anode :-

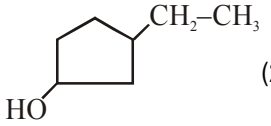
(1) C_2H_6, H_2

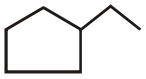
(2) C_3H_8, CO_2

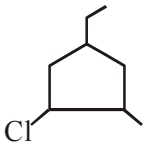
(3) $C_2H_6 + C_4H_6 + CO_2$

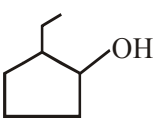
(4) $C_2H_6 + C_4H_{10} + CO_2\uparrow$

22.  $\xrightarrow[HCl]{Zn(Hg)}$ (A); Identify the A. :-

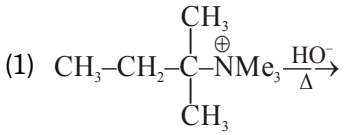
(1) 

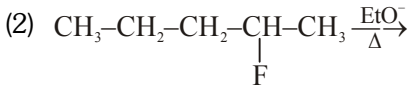
(2) 

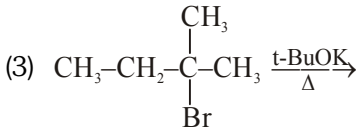
(3) 

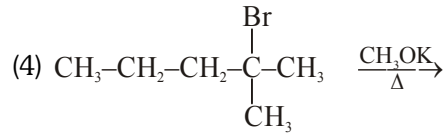
(4) 

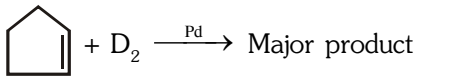
23. In which of the following reaction Saytzeff alkene is major product ?

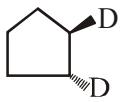
(1) 

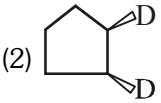
(2) 

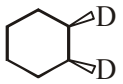
(3) 

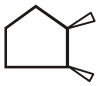
(4) 

24. 

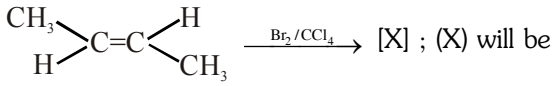
(1) 

(2) 

(3) 

(4) 

25. In the given reaction

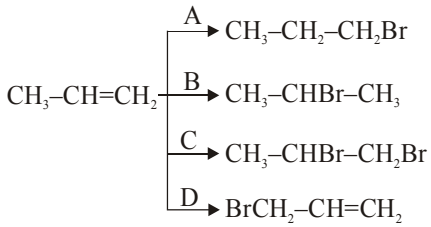


[X] ; (X) will be

(1) Meso-2,3-dibromobutane
(2) Racemic mixture of 2,3-dibromobutane
(3) Meso as well as racemic mixture
(4) 1-Bromo-2-butene

26. Match the column :

List-I

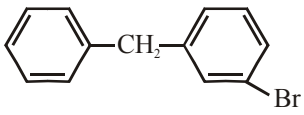


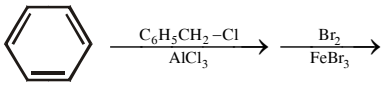
List-II

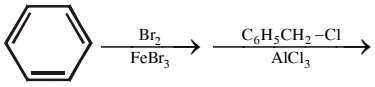
(i) HBr (ii) HBr + peroxide
(iii) NBS (iv) Br_2, low temperature

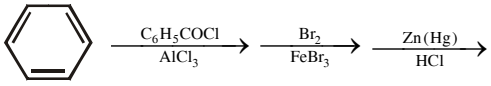
	A	B	C	D
(1)	(ii)	(i)	(iv)	(iii)
(2)	(i)	(ii)	(iv)	(iii)
(3)	(i)	(iii)	(iv)	(ii)
(4)	(ii)	(i)	(iii)	(iv)

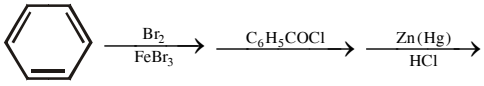
27. Which sequence of steps describes the best synthesis of compound :-



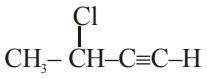
(1) 

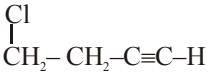
(2) 

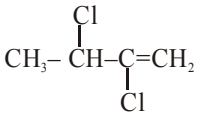
(3) 

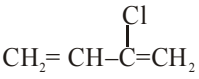
(4) 

28. CH_2= CH–C≡C–H + H–Cl Product is :-

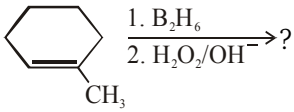
(1) 

(2) 

(3) 

(4) 

29. 1-Methylcyclohexane is allowed to react with B_2H_6. The product is then treated with H_2O_2 and NaOH.

The reaction is : 

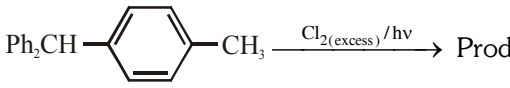
The product formed is :-

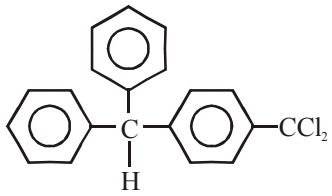
(1) 1-methyl cyclohexanol

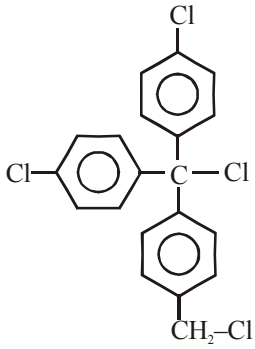
(2) 2-methyl cyclohexanol

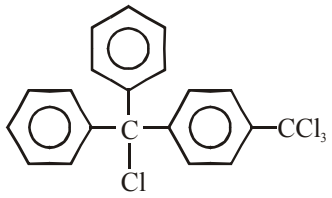
(3) (±) trans-2-methyl cyclohexanol

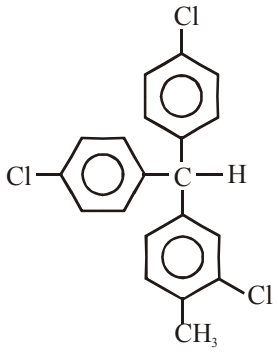
(4) (±) Cis-2-methyl cyclohexanol

30. 

(1) 

(2) 

(3) 

(4) 

ANSWER KEY										Exercise-1
Que.	1	2	3	4	5	6	7	8	9	10
Ans.	**1**	**2**	**4**	**2**	**3**	**2**	**2**	**4**	**2**	**3**
Que.	11	12	13	14	15	16	17	18	19	20
Ans.	**2**	**3**	**4**	**1**	**3**	**2**	**1**	**2**	**1**	**1**
Que.	21	22	23	24	25	26	27	28	29	30
Ans.	**2**	**2**	**4**	**2**	**1**	**1**	**3**	**4**	**3**	**3**

1. Alcoholic solution of KOH is a specific reagent for **[IIT-90]**

(1) Dehydration

(2) Dehydrogenation

(3) Dehydro halogenation

(4) Dehalogenation

2. 1–chlorobutane on reaction with alcoholic potash gives **[IIT-91]**

(1) 1–butene

(2) 1–butanol

(3) 2–butene

(4) 2–butanol

3. The product (s) obtained via oxymercutation ($HgSO_4 + H_2SO_4$) of 1–butyne would be - **[IIT-92, 99]**

(1) $CH_3 - CH_2 - \underset{\underset{O}{\|}}{C} - CH_3$

(2) $CH_3–CH_2–CH_2–CHO$

(3) $CH_3–CH_2–CHO–HCHO$

(4) $CH_3–CH_2–COOH+HCOOH$

4. The chief reaction product of reaction between n-butane and bromine at 130° C is - **[IIT-95]**

(1) $CH_3CH_2CH_2CH_2Br$ (2) $CH_3CH_2\underset{\underset{CH_3}{|}}{CH}Br$

(3) $CH_3–\underset{\underset{CH_3}{|}}{CH}CH_2Br$ (4) $CH_3–\underset{\underset{CH_3}{|}}{C}–Br_2$

5. When cyclohexane is poured on water, it floats, because - **[IIT-97]**

(1) Cyclohexane is in 'boat' form

(2) Cyclohexane is in 'chair' form

(3) Cyclohexane is in 'crown' form

(4) Cyclohexane is less dense than water

6. Propyne and propene can be distinguished by - **[IIT-2000]**

(1) conc. H_2SO_4

(2) Br_2 in CCl_2

(3) dil.$KMnO_4$

(4) $AgNO_3$ in ammonia

7. In the presence of peroxide, hydrogen chloride and hydrogen iodide do not give anti-Markovnikov addition to alkene because - **[IIT Screening-2001]**

(1) Both are highly ionic

(2) One is oxidising and the other is reducing

(3) One of the step is endothermic in both the cases

(4) All the steps are exothermic in both cases

8. The reaction of propene with HOCl proceeds via the addition of - **[IIT Screening-2001]**

(1) H^+ in the first step

(2) Cl^+ in first step

(3) OH^- in first step

(4) Cl^+ and OH^- in single step

9. Consider the following reactions - **[IIT Screening-2002]**

$$H_3C–\underset{\underset{D}{|}}{CH}–\underset{\underset{CH_3}{|}}{CH}–CH_3 + \dot{B}r \longrightarrow \text{'X'} + HBr$$

Identify the structure of the major product 'X'

(1) $H_3C–\underset{\underset{D}{|}}{CH}–\underset{\underset{CH_3}{|}}{CH}–\dot{C}H_2$

(2) $H_3C–\underset{\underset{D}{|}}{CH}–\underset{\underset{CH_3}{|}}{\dot{C}}–CH_3$

(3) $H_3C–\underset{\underset{D}{|}}{\dot{C}}–\underset{\underset{CH_3}{|}}{CH}–CH_3$

(4) $H_3C–\dot{C}H–\underset{\underset{CH_2D}{|}}{CH}–CH_3$

10. Identify a reagent from the following list which can easily distinguish between 1–butyne and 2–butyne **[IIT Screening-2002]**

(1) Bromine, CCl_4

(2) H_2, Lindlar catalyst

(3) dilute H_2SO_4, $HgSO_4$

(4) ammonical Cu_2Cl_2 solution

11. Which of these will not react with acetylene - **[AIEEE-2002]**

(1) NaOH

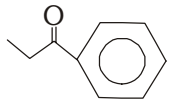
(2) ammonical $AgNO_3$

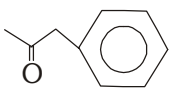
(3) Na

(4) HCl

12. $C_6H_5-C\equiv C-CH_3 \xrightarrow[H_2SO_4]{HgSO_4} A$

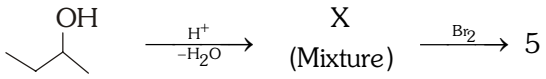
[IIT Screening-2003]

(1) 

(2) 

(3) $C_6H_5-\underset{\underset{OH}{|}}{C}=CHCH_3$

(4) $C_6H_5-CH=\underset{\underset{OH}{|}}{C}-CH_3$

13. 

compounds of molecular formula $C_4H_8Br_2$.No. of compounds X will be **[IIT Screening-2003]**

(1) 2 (2) 3 (3) 4 (4) 5

14. 1–Butene may be converted to butane by reaction with - **[AIEEE-2003]**

(1) Pd/H_2 (2) Zn - HCl

(3) Sn - HCl (4) Zn - Hg/HCl

15. On mixing a certain alkane with chlorine and irradiating it with ultraviolet light, it forms only one monochloroalkane. This alkane could be - **[AIEEE-2003]**

(1) neopentane (2) propane

(3) pentane (4) isopentane

16. 2–hexyne can be converted into trans –2–hexene by the reaction of - **[IIT Screening-2004]**

(1) $H_2/Pd/BaSO_4$ (2) Li in Liquid NH_3

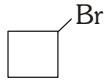
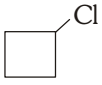
(3) H_2/PtO_2 (4) $NaBH_4$

17. Which one of the following is reduced with Zn-Hg/HCl to give the corresponding hydrocarbon **[AIEEE-2004]**

(1) Butane-2-one (2) Acetic acid

(3) Acetamide (4) Ethyl acetate

18. 1–Bromo–3–chloro cyclobutane on reaction with 2–equivalent of sodium in ether gives - **[IIT-2005]**

(1)  (2)  (3)  (4) 

19. 2-Methylbutane on reacting with bromine in the presence of sunlight gives mainly **[AIEEE-05]**

(1) 2–bromo-2–methylbutane

(2) 1–bromo-2–methylbutane

(3) 1–bromo-3–methylbutane

(4) 2–bromo-3–methylbutane

20. Alkyl halides react with dialkyl copper reagent to give **[AIEEE-05]**

(1) alkyl copper halides

(2) alkenes

(3) alkenyl halides

(4) alkanes

21. Reaction of one molecule of HBr with one molecule of 1,3–butadiene at 40°C gives predominantly **[AIEEE-05]**

(1) 1–bromo–2–butene under thermodynamically controlled conditions

(2) 3–bromobutene under kinetically controlled conditions

(3) 1–bromo–2–butene under kinetically controlled conditions

(4) 3–bromobutene under thermodynamically controlled conditions

22. Acid catalyzed hydration of alkenes except ethene leads to the formation of **[AIEEE-05]**

(1) secondary or tertiary alcohol

(2) primary alcohol

(3) mixture of secondary and tertiary alcohols

(4) mixture of primary and secondary alcohols

23. Elimination of Hydrogen bromide from 2–bromobutane results in the formation of **[AIEEE-05]**

(1) predominantly 2–butene

(2) equimolar mixture of 1 and 2–butene

(3) predominantly 2–butyne

(4) predominantly 1–butene

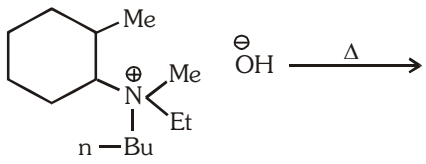
24. $CH_3-CH=CH_2 \xrightarrow{NOCl}$ Product, product is : **[IIT-2006]**

(1) $CH_3-\underset{\underset{Cl}{|}}{CH}-CH_2-NO$

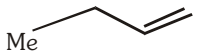
(2) $CH_3-\underset{\underset{NO}{|}}{CH}-CH_2-Cl$

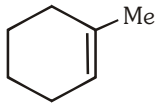
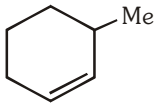
(3) $CH_3-CH_2-CH_2-Cl$

(4) $NO-CH_2-CH_2-CH_2-Cl$

25. 

The alkene formed as a major product in the above elimination reaction is- **[AIEEE-06]**

(1)  (2) $CH_2=CH_2$

(3)  (4) 

26. Reaction of trans-2-phenyl-1-bromocyclo pentane on reaction with alcoholic KOH produces- **[AIEEE-06]**

(1) 4-phenyl cyclopentene

(2) 2-phenyl cyclopentene

(3) 1-phenyl cyclopentene

(4) 3-phenyl cyclopentene

27. Phenyl magnesium bromide reacts with methanol to give- **[AIEEE-06]**

(1) A mixture of anisole and Mg(OH)Br

(2) A mixture of benzene and Mg(OMe)Br

(3) A mixture of toluene and Mg(OH)Br

(4) A mixture of phenol and Mg(Me)Br

28. Which of the following reactions will yield, 2, 2-dibromopropane **[AIEEE-2007]**

(1) $CH_3—C\equiv CH + 2HBr \longrightarrow$

(2) $CH_3CH=CHBr + HBr \longrightarrow$

(3) $CH\equiv CH + 2HBr \longrightarrow$

(4) $CH_3 — CH = CH_2 + HBr \longrightarrow$

29. In the following sequence of reactions, the alkene affords the compound 'B' :- **[AIEEE-2008]**

$CH_3CH=CHCH_3 \xrightarrow{O_3} A \xrightarrow[Zn]{H_2O} B.$

The compound B is

(1) CH_3CH_2CHO (2) CH_3COCH_3

(3) $CH_3CH_2COCH_3$ (4) CH_3CHO

30. The hydrocarbon which can react with sodium in liquid ammonia is **[AIEEE-2008]**

(1) $CH_3CH_2CH_2C\equiv CCH_2CH_2CH_3$

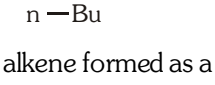
(2) $CH_3CH_2C\equiv CH$

(3) $CH_3CH=CHCH_3$

(4) $CH_3CH_2C\equiv CCH_2CH_3$

31. The treatment of CH_3MgX with $CH_3C\equiv C–H$ produces **[AIEEE-2008]**

(1) $CH_3–CH=CH_2$ (2) $CH_3C\equiv C–CH_3$

(3)  (4) CH_4

32. One mole of a symmetrical alkene on ozonolysis gives two moles of an aldehyde having a molecular mass of 44 u. The alkene is :- **[AIEEE-2010]**

(1) ethene (2) propene

(3) 1-butene (4) 2-butene

33. The synthesis of 3–octyne is achieved by adding a bromoalkane into a mixture of sodium amide and an alkyne. The bromoalkane and alkyne respectively are – **[IIT-2010]**

(1) $BrCH_2CH_2CH_2CH_2CH_3$ and $CH_3CH_2C\equiv CH$

(2) $BrCH_2CH_2CH_3$ and $CH_3CH_2CH_2C\equiv CH$

(3) $BrCH_2CH_2CH_2CH_2CH_3$ and $CH_3C\equiv CH$

(4) $BrCH_2CH_2CH_2CH_3$ and $CH_3CH_2C\equiv CH$

34. Ozonolysis of an organic compound gives formaldehyde as one of the products. This confirms the presence of :- **[AIEEE-2011]**

(1) an isopropyl group

(2) an acetylenic triple bond

(3) two ethylenic double bonds

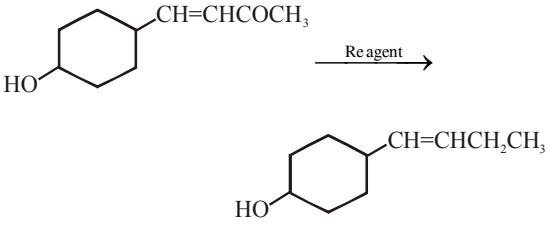
(4) a vinyl group

35. 2–Hexyne gives trans –2–Hexene on treatment with:- **[AIEEE-2012]**

(1) Li AlH_4 (2) Pt/H_2

(3) Li/NH_3 (4) $Pd/BaSO_4$

36. In the given transformation, which of the following is the most appropriate reagent ? **[AIEEE-2012]**



(1) $NaBH_4$ (2) $NH_2NH_2, \overset{\ominus}{O}H$

(3) Zn – Hg / HCl (4) Na, Liq.NH_3

37. The hydration of propyne results in formation of :- **[AIEEE-2012(Online)]**

(1) Propanol–1 (2) Propanal

(3) Acetone (4) Propene

38. Consider the following sequence of reactions:

$$CH_3CH=CH_2 \xrightarrow[700K]{Cl_2} A \xrightarrow[420K,\ 12\ atm]{Na_2CO_3} B \xrightarrow[(ii)\ NaOH]{(i)\ HOCl} C$$

compound 'C' is :- **[AIEEE-2012(Online)]**

(1) $CH_2OH-CHOH-CH_2OH$ (2) $CH_3CH(OH)COCl$

(3) $HOCH_2-CH=CH_2$ (4) $CH_3CH(OH)COONa$

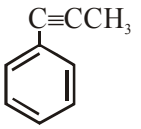
39. The major product obtained in the photobromination of 2-methyl butane is :- **[AIEEE-2012(Online)]**

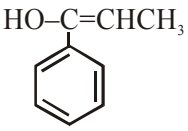
(1) 2-bromo-3-methylbutane
(2) 1-bromo-2-methylbutane
(3) 1-bromo-3-methylbutane
(4) 2-bromo-2-methylbutane

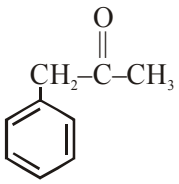
40. The reaction, **[AIEEE-2012(Online)]**

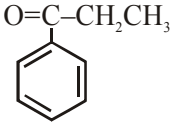
$CH_3CHO \xrightarrow[Zn(Hg)/Conc.HCl]{[H]} CH_3CH_3$ is :-

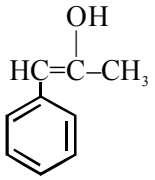
(1) Cannizaro's reaction
(2) Wolf-Kishner reduction
(3) Rosenmund reduction
(4) Clemmenson reduction

41. In the given reaction  $\xrightarrow{H^+/Hg^{2+}}$ A the product 'A' is :- **[AIEEE-2012(Online)]**

(1) 

(2) 

(3) 

(4) 

42. The reaction of propene with HOCl ($Cl_2 + H_2O$) proceeds through the intermediate : **[JEE MAINS-2016]**

(1) $CH_3-CHCl-CH_2^+$

(2) $CH_3-CH^+-CH_2-OH$

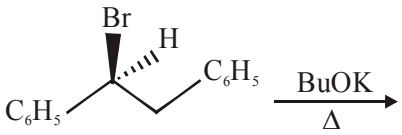
(3) $CH_3-CH^+-CH_2-Cl$

(4) $CH_3-CH(OH)-CH_2^+$

43. 3-Methyl-pent-2-ene on reaction with HBr in presence of peroxide forms an addition product. The number of possible stereoisomers for the product is :- **[JEE MAINS-2017]**

(1) Six (2) Zero
(3) Two (4) Four

44. The major product obtained in the following reaction is :- **[JEE MAINS-2017]**



(1) $(\pm)C_6H_5CH(O^tBu)CH_2CH_6H_5$

(2) $C_6H_5CH=CHC_6H_5$

(3) $(+)C_6H_5CH(O^tBu)CH_2H_5$

(4) $(-)C_6H_5CH(O^tBu)CH_2C_6H_5$

PREVIOUS YEARS QUESTIONS				ANSWER KEY						Exercise-II
Que.	1	2	3	4	5	6	7	8	9	10
Ans.	**3**	**1**	**1**	**2**	**4**	**4**	**3**	**2**	**2**	**4**
Que.	11	12	13	14	15	16	17	18	19	20
Ans.	**1**	**1**	**2**	**1**	**1**	**2**	**1**	**3**		**4**
Que.	21	22	23	24	25	26	27	28	29	30
Ans.	**1**	**1**	**1**	**1**	**2**	**4**	**2**	**1**	**4**	**2**
Que.	31	32	33	34	35	36	37	38	39	40
Ans.	**4**	**4**	**4**	**4**	**3**	**2**	**3**	**1**	**4**	**4**
Que.	41	42	43	44						
Ans.	**3**	**3**	**4**	**2**						