ALLEN CAREER INSTITUTE KOTA (RAJASTHAN)

path to success



PRE-MEDICAL

# ORGANIC CHEMISTRY

ENTHUSIAST | LEADER | ACHIEVER

## EXERCISE

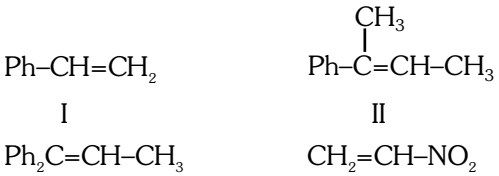
## Reaction Mechanism-II

ENGLISH MEDIUM

## EXERCISE-I (Conceptual Questions) — Build Up Your Understanding

### ELECTROPHILIC ADDITION REACTION

**1.** Correct reactivity order for EAR of following compounds is



I $Ph-CH=CH_2$ II $Ph-C(CH_3)=CH-CH_3$

III $Ph_2C=CH-CH_3$ IV $CH_2=CH-NO_2$

(1) IV > I > II > III (2) III > II > I > IV

(3) II > III > I > IV (4) II > III > IV > I

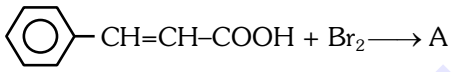
**HC0160**

**2.** The intermediate during the addition of HCl to propene in the presence of peroxide is

(1) $CH_3-\dot{C}H-CH_2Cl$ (2) $CH_3-\overset{\oplus}{C}H-CH_3$

(3) $CH_3-CH_2-\overset{\oplus}{C}H_2$ (4) $CH_3-\dot{C}H-CH_3$

**HC0161**

**3.** 

the number of chiral carbons in 'A' are

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

**HC0163**

**4.** $CH_3-CH=CH_2 \xrightarrow{dil/H_2SO_4} A$

$CH_3-CH=CH_2 \xrightarrow{B_2H_6} \xrightarrow[^-OH]{H_2O_2} B$

Wrong statement about the product is

(1) A and B have the same functional group

(2) A and B are position isomers.

(3) A and B show chain isomerism

(4) Mixed ether is the isomer of both A and B

**HC0164**

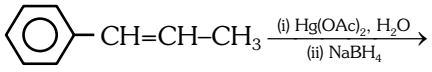
**5.** Which of the following alkene is most reactive for hydration

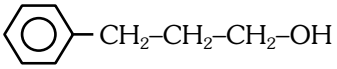
(1) ethene (2) propene

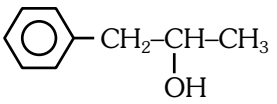
(3) 1–butene (4) 2–methyl propene

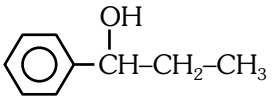
**HC0165**

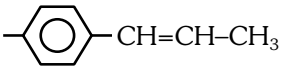
**6.** The major product of the following reaction is



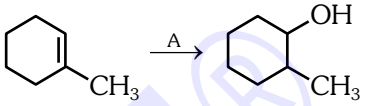
(1) 

(2) 

(3) 

(4) 

**HC0166**

**7.**  ; Reagent 'A' is

(1) $BH_3, H_2O_2/\overset{\ominus}{O}H$

(2) $H_2O/H^{\oplus}$

(3) $Hg(OCOCH_3)_2, H_2O/NaBH_4$

(4) $Cl_2$/aq. NaOH

**HC0167**

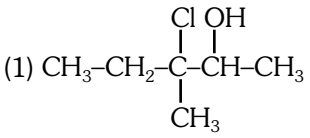
**8.** Which of the following alkenes on hydration gives a tertiary alcohol

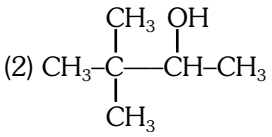
(1) 2–Butene (2) Isobutylene

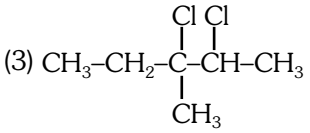
(3) Ethene (4) α–Butylene

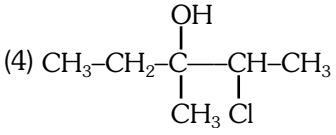
**HC0168**

**9.** The predominant product formed when 3–methyl–2–pentene reacts with HOCl is

(1) 

(2) 

(3) 

(4) 

**HC0169**

**10.** Propene on addition with HI, gives

(1) $CH_3—CHI—CH_3$ (2) $CH_3—CH_2—CH_2I$

(3) $CH_3—CHI—CH_2I$ (4) None of the above

**HC0170**

**11.** What is the main product of this reaction?

$CH_3 - C \equiv CH \xrightarrow[\text{Excess}]{HCl(g)} ?$

(1) $CH_3-\overset{\overset{Cl}{|}}{C}=CH_2$

(2) $CH_3-\underset{\underset{Cl}{|}}{CH}-\underset{\underset{Cl}{|}}{CH_2}$

(3) $CH_3-CH_2-CH\begin{matrix}Cl\\Cl\end{matrix}$

(4) $CH_3-\overset{\overset{Cl}{|}}{\underset{\underset{Cl}{|}}{C}}-CH_3$

**HC0171**

**12.** 1–Phenyl propene on reaction with HBr gives (as a major product)

(1) $C_6H_5CH_2CH(Br)CH_3$

(2) $C_6H_5CH(Br)CH_2CH_3$

(3) $C_6H_5CH_2CH_2CH_2Br$

(4) $C_6H_5CH(Br)CH=CH_2$

**HC0173**

## NUCLEOPHILIC ADDITION REACTION

**13.** Cyanohydrin of the following compound on hydrolysis gives compound that can show optical isomerism :

(1) HCHO (2) $CH_3CHO$

(3) $CH_3COCH_3$ (4) All the above

**CC0175**

**14.** When acetone reacts with Grignard reagent followed by hydrolysis, it gives :

(1) 1° –alcohol (2) 2° –alcohol

(3) 3° –alcohol (4) Methyl alcohol

**CC0178**

## FREE RADICAL ADDITION REACTION

**15.** Reaction of HBr with propene in the presence of peroxide gives

(1) 3–bromo propane (2) Allyl bromide

(3) n–propyl bromide (4) Isopropyl bromide

**HC0179**

**16.** Isobutylene $\xrightarrow[H_2O_2]{HBr}$ "product". The product is

(1) Isobutyl bromide (2) Tert. butyl bromide

(3) Tert. butyl alcohol (4) isobutyl alcohol

**HC0180**

## FREE RADICAL SUBSTITUTION REACTION

**17.** The nitrating agent for the nitration of alkanes is:

(1) Conc. $HNO_3$

(2) Mixture of conc. $HNO_3$ and conc. $H_2SO_4$

(3) Acetyl nitrate

(4) $HNO_3$ vapours at high temperature

**HC0182**

**18.** The chain propagating step is fastest in the reaction of an alkane with

(1) Fluorine free radical

(2) Chlorine free radical

(3) Iodine free radical

(4) Bromine free radical

**HC0183**

**19.** In the nitration of propane, the product obtained in maximum yield is

(1) 1–nitropropane (2) 2-nitropropane

(3) Nitroethane (4) Nitromethane

**HC0184**

**20.** Only two isomeric monochloro derivatives are possible for (exclude stereo isomers)

(1) n-butane

(2) 2, 4-dimethyl pentane

(3) benzene

(4) 2-methyl butane

**HC0185**

**21.** What is the chief product obtained when n-butane is treated with bromine in the presence of light at 130°C ?

(1) $CH_3-CH_2-CH_2-CH_2-Br$

(2) $CH_3-CH_2-\underset{\underset{CH_3}{|}}{CH}-Br$

(3) $CH_3-\underset{\underset{CH_3}{|}}{CH}-CH_2-Br$

(4) $CH_3-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}-CH_2-Br$

**HC0186**

## ELECTROPHILIC SUBSTITUTION REACTION

**22.** The strongest deactivating effect on aromatic ring is

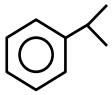
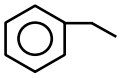
(1) $-CH_2Cl$ (2) $-OCH_3$

(3) $-CH_3$ (4) $-CCl_3$

**AH0187**

**23.** Which of the following is maximum reactive towards E.S.R. :-

(1)  (2) 

(3)  (4) 

**AH0188**

**24.** Correct order of reactivity of following compound with an electrophile :-

(I) p–$CH_3$–$C_6H_4$–$CH_3$

(II) $C_6H_5$–$CH_3$

(III) p–$CH_3$–$C_6H_4$–$NO_2$

(IV) p–$O_2N$–$C_6H_4$–$NO_2$

(1) I > II > III > IV (2) II > I > IV > III

(3) III > II > I > IV (4) IV > III > II > I

**AH0189**

**25.** Toluene is more reactive than benzene towards electrophilic reagents due to :-

(1) Inductive effect only

(2) Hyperconjugative effect only

(3) Both inductive as well as hyperconjugative effects

(4) Strong mesomeric effect

**AH0190**

**26.** Nitration of benzene is

(1) nucleophilic substitution

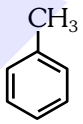
(2) nucleophilic addition

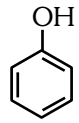
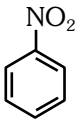
(3) electrophilic substitution

(4) electrophillic addition

**AH0191**

**27.** Consider the following compounds :

(I)  (II) 

(III)  (IV) 

Correct order of their reactivity in electrophilic substitution reactions would be :-

(1) I > II > III > IV (2) IV > III > II > I

(3) III > II > I > IV (4) III > IV > I > II

**AH0192**

**28.** The active species in the nitration of benzene is

(1) $NO_2^+$ (2) $HNO_3$ (3) $NO_3^-$ (4) $NO_2^-$

**AH0193**

**29.** The function of anhydrous $AlCl_3$ in the Friedel craft's reaction

(1) To absorb water

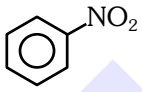
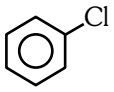
(2) To absorb HCl

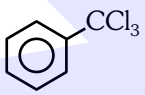
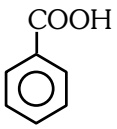
(3) To produce electrophile

(4) To produce Nucleophile

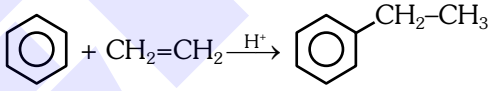
**AH0194**

**30.** In which of the following compound the electrophile attack on o– and p– positions :

(1)  (2) 

(3)  (4) 

**AH0195**

**31.** 

Incorrect statement about this reaction

(1) Benzene is substrate

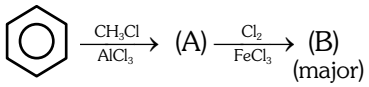
(2) Ethene is reagent

(3) Reaction is EAR with respect to ethene

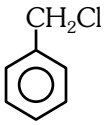
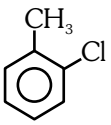
(4) Reaction is NSR for benzene

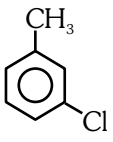
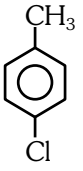
**AH0401**

**32.** For the reaction



Product B is :

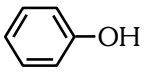
(1)  (2) 

(3)  (4) 

**AH0402**

## NUCLEOPHILIC SUBSTITUTION REACTION

**33.** The correct reactivity order towards H–X will be

(I)  –OH (II) $CH_2$=CH–$CH_2$OH

(III) $CH_3$–$CH_2$–OH (IV) $CH_3$–CH(OH)–$CH_3$

(1) II > I > III > IV (2) IV > III > II > I

(3) II > IV > I > III (4) II > IV > III > I

**AE0196**

**34.** Which of the following product will be obtained when neopentyl alcohol is treated with conc. HCl in presence of $ZnCl_2$.

(1) t– butyl chloride (2) isobutylene

(3) t– pentyl chloride (4) Neo pentyl chloride

**AE0197**

**35.** In $S_N1$ the first step involves the formation of

(1) free radical (2) carbanion

(3) carbocation (4) final product

**HD0198**

**36.** To form alkane isonitrile, alkyl halide is reacted with:

(1) KCN (2) AgCN

(3) NaCN (4) $NH_4CN$

**HD0199**

**37.** Alkyl fluorides are synthesised by

(1) Finkelstein reaction (2) Swart reaction

(3) Kolbe reaction (4) Wurtz reaction

**HD0201**

**38.** The products of reaction of alcoholic silver nitrite with ethyl bromide are

(1) Ethane (2) Ethene

(3) Ethyl alcohol (4) Nitro ethane

**HD0202**

**39.** For the reaction,

$C_2H_5OH + HX \longrightarrow C_2H_5X$, the order of reactivity is

(1) HI > HCl > HBr (2) HI > HBr > HCl

(3) HCl > HBr > HI (4) HBr > HI > HCl

**AE0203**

**40.** The reaction, $CH_3Br + OH^- \longrightarrow CH_3OH + Br^-$ obeys the mechanism

(1) $S_N1$ (2) $S_N2$ (3) $E^1$ (4) $E^2$

**HD0204**

**41.** Butanenitrile may be prepared by heating

(1) Propyl alcohol with KCN

(2) Butyl alcohol with KCN

(3) Butyl chloride with KCN

(4) Propyl chloride with KCN

**HD0205**

**42.** The given reaction is an example of

$C_2H_5Br + KCN(aq.) \longrightarrow C_2H_5CN + KBr$

(1) Elimination

(2) Nucleophilic substitution

(3) Electrophilic substitution

(4) Redox change

**HD0206**

**43.** An alkyl halide may be converted into an alcohol by

(1) Addition (2) Substitution

(3) Dehydrohalogenation (4) Elimination

**AE0208**

**44.** Compound is most reactive towards NaOH in

(1) $CH_3Cl$ (2) $CH_2$=CHCl

(3) $C_6H_5Cl$ (4) $C_6H_5CH_2Cl$

**HD0209**

**45.** Most stable carbocation formed from $(CH_3)_3C$–Br, $(C_6H_5)_3CBr$,$(C_6H_5)_2CHBr$ and $C_6H_5CH_2Br$ would be

(1) $C_6H_5\overset{\oplus}{C}H_2$ (2) $(CH_3)_3\overset{\oplus}{C}$

(3) $(C_6H_5)_3\overset{\oplus}{C}$ (4) $(C_6H_5)_2\overset{\oplus}{C}H$

**HD0210**

**46.** $S_N1$ reaction on an optically active substrate having only one chiral centre which is also reaction centre, gives :-

(1) Retention in configuration

(2) Inversion in configuration

(3) Partially racemised product

(4) Complete racemised product

**HD0414**

**47.** The hydrolysis of alkyl halides by aqueous NaOH is best termed as
(1) electrophilic substitution reaction
(2) electrophilic addition reaction
(3) nucleophilic addition reaction
(4) nucleophilic substitution reaction

**HD0212**

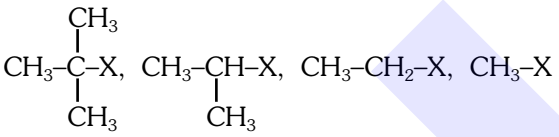
**48.** Reaction of sodium ethoxide and ethyl iodide will give :-
(1) Ether (2) Ethyl alcohol
(3) Acetaldehyde (4) Acetic acid

**HD0213**

**49.** The least reactive chlorine is present in
(1) Methyl chloride (2) Allyl chloride
(3) Ethyl chloride (4) Vinyl chloride

**HD0214**

**50.** Arrange the following compounds in the increasing order of their $S_N^2$ reactivity?



(a) (b) (c) (d)

(1) (a) < (b) < (c) < (d) (2) (a) < (c) < (d) < (b)
(3) (d) < (c) < (b) < (a) (4) (b) < (d) < (c) < (a)

**HD0215**

**51.** Which alcohol produces turbidity with Lucas reagent most slowly
(1) 2–Butanol (2) t–Butyl alcohol
(3) Isobutyl alcohol (4) Diphenylcarbinol

**AE0216**

**52.** The reaction of ethyl iodide with sodium ethoxide is
(1) An electrophilic substitution reaction
(2) A nucleophilic addition reaction
(3) A nucleophilic substitution reaction
(4) A free radical substitution reaction

**HD0218**

**53.** The Williamson synthesis involves :-
(1) A nucleophilic addition
(2) An electrophilic substitution
(3) $SN^2$ displacement
(4) $SN^1$ displacement

**HD0219**

**54.** In the Williamson synthesis of ethers given by the general equation –
R–X + R'ONa ⟶ R–O–R' the yield from R–X follows the sequence :-
(1) $CH_3X > 1° > 2° > 3°$
(2) $CH_3X < 1° < 2° < 3°$
(3) $CH_3X < 1° < 2° > 3°$
(4) $CH_3X > 1° < 2° < 3°$

**HD0220**

**55.** With conc. HBr ethyl phenyl ether yields :–
(1) Phenol and ethyl bromide.
(2) Bromobenzene and ethanol
(3) Phenol and ethane
(4) Bromobenzene and ethane

**HD0221**

## ELIMINATION REACTION

**56.** The reactivity of alkyl halides in $E^2$ elimination reactions follows the order
(1) R–I < R–Br < R–Cl < R–F
(2) R–F < R–Cl < R–Br < R–I
(3) R–I > R–Cl > R–Br < R–F
(4) R–I < R–Br < R–F < R–Cl

**HD0223**

**57.** The unimolecular elimination involves formation of
(1) A free radical (2) A carbanion
(3) A carbocation (4) A biradical

**HD0224**

**58.** Which of the following alkyl halides gives a mixture of alkenes on dehydrohalogenation
(1) n–Propyl halide
(2) Isopropyl halide
(3) s–Butyl bromide
(4) t–Butyl bromide

**HD0227**

**59.** Arrange the following alkanols A, B and C in order of their reactivity towards acid catalysed dehydration:-

(A) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH_2-CH_2-OH$

(B) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{\overset{\displaystyle OH}{\overset{|}{C}}}}-CH_2-CH_3$

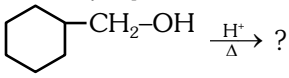
(C) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-\underset{\displaystyle OH}{\underset{|}{CH}}-CH_3$

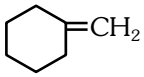
(1) A > B > C (2) B > A > C

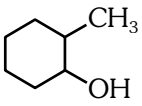
(3) B > C > A (4) C > B > A

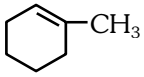
**AE0228**

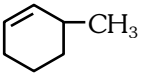
**60.** The major product in the following reaction is



(1) 

(2) 

(3) 

(4) 

**HD0229**

**61.** Arrange the following alkyl halides in decreasing order of the rate of elimination reaction with alcoholic KOH.

(A) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{\overset{\displaystyle H}{\overset{|}{C}}}}-CH_2-Br$ (B) $CH_3-CH_2-Br$

(C) $CH_3-CH_2-CH_2-Br$

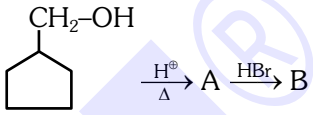
(1) A > B > C

(2) C > B > A

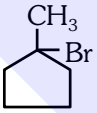
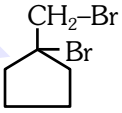
(3) B > C > A

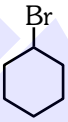
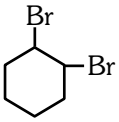
(4) A > C > B

**HD0231**

**62.** 

What is the structure of B :-

(1)  (2) 

(3)  (4) 

**AE0415**

## EXERCISE-I (Conceptual Questions) ANSWER KEY

| Que. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ans. | 2 | 2 | 2 | 3 | 4 | 3 | 1 | 2 | 4 | 1 | 4 | 2 | 2 | 3 | 3 |
| Que. | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| Ans. | 1 | 4 | 1 | 2 | 1 | 2 | 4 | 2 | 1 | 3 | 3 | 3 | 1 | 3 | 2 |
| Que. | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 |
| Ans. | 4 | 2 | 4 | 3 | 3 | 2 | 2 | 4 | 2 | 2 | 4 | 2 | 2 | 4 | 3 |
| Que. | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| Ans. | 3 | 4 | 1 | 4 | 1 | 3 | 3 | 3 | 1 | 1 | 2 | 3 | 3 | 3 | 3 |
| Que. | 61 | 62 | | | | | | | | | | | | | |
| Ans. | 4 | 3 | | | | | | | | | | | | | |

## EXERCISE-II (Previous Year Questions) AIPMT/NEET

### AIPMT 2006

**1.** Nucleophilic addition reaction will be most favoured in :

(1) $CH_3CH_2CH_2-\overset{\overset{O}{\|}}{C}-CH_3$

(2) $CH_3-\overset{\overset{O}{\|}}{C}-CH_3$

(3) $CH_3-CH_2-CH_2-\overset{\overset{O}{\|}}{C}-H$

(4) $CH_3-\overset{\overset{O}{\|}}{C}-H$

**CC0232**

**2.** The major organic products of reaction are $CH_3-O-CH(CH_3)_2 + HI \longrightarrow$

(1) $CH_3OH + (CH_3)_2CHI$

(2) $ICH_2-O-CH(CH_3)_2$

(3) $CH_3-O-\underset{\underset{I}{|}}{C}(CH_3)_2$

(4) $CH_3I + (CH_3)_2CHOH$

**AE0233**

### AIPMT 2007

**3.** Predict the product 'C' obtained in the following reaction of 1-butyne :

$CH_3-CH_2-C\equiv CH \xrightarrow{HCl} B \xrightarrow{HI} C$

(1) $CH_3-CH_2-CH_2-\underset{\underset{Cl}{|}}{\overset{\overset{I}{|}}{C}}-H$

(2) $CH_3-CH_2-\underset{\underset{I}{|}}{CH}-CH_2Cl$

(3) $CH_3-CH_2-\underset{\underset{Cl}{|}}{\overset{\overset{I}{|}}{C}}-CH_3$

(4) $CH_3-\underset{\underset{Cl}{|}}{CH}-CH_2-CH_2I$

**HC0235**

**4.** The order of decreasing reactivity towards electrophilic reagent for the following :

(a) Benzene (b) Toluene

(c) Chloro benzene (d) Phenol

(1) b > d > a > c (2) d > c > b > a

(3) d > b > a > c (4) a > b > c > d

**AH0236**

**5.** For the following :

(a) $I^-$ (b) $Cl^-$ (c) $Br^-$

the increasing order of nucleophilicity would be :

(1) $Cl^- < Br^- < I^-$ (2) $I^- < Cl^- < Br^-$

(3) $Br^- < Cl^- < I^-$ (4) $I^- < Br^- < Cl^-$

**HD0237**

**6.** In the reaction :

$CH_3-\underset{\underset{CH_3}{|}}{CH}-CH_2-O-CH_2-CH_3 + HI \longrightarrow .....$

which of following compounds will be formed :

(1) $CH_3-\underset{\underset{CH_3}{|}}{CH}-CH_3 + CH_3-CH_2-OH$

(2) $CH_3-\underset{\underset{CH_3}{|}}{CH}-CH_2-OH + CH_3-CH_3$

(3) $CH_3-\underset{\underset{CH_3}{|}}{CH}-CH_2-OH + CH_3-CH_2-I$

(4) $CH_3-\underset{\underset{CH_3}{|}}{CH}-CH_2-I + CH_3-CH_2-OH$

**AE0238**

### AIPMT 2008

**7.** $H_3C-\underset{\underset{CH_3}{|}}{CH}-CH=CH_2 + HBr \longrightarrow A$

A (Predominantly) is :

(1) $CH_3-\underset{\underset{Br}{|}}{\overset{\overset{CH_3}{|}}{C}}-CH_2CH_3$

(2) $CH_3-\underset{\underset{Br}{|}}{CH}-\underset{\underset{CH_3}{|}}{CH}-CH_3$

(3) $CH_3-\underset{\underset{CH_3}{|}}{CH}-\underset{\underset{Br}{|}}{CH}-CH_3$

(4) $CH_3-\underset{\underset{CH_3}{|}}{CH}-CH_2-CH_2Br$

**HC0239**

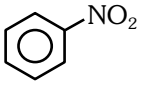
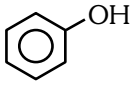
**8.** In a $S_N^2$ substitution reaction of the type $R–Br + Cl^{\ominus} \xrightarrow{DMF} R–Cl + Br^{\ominus}$, which one of the following has the highest relative rate ?

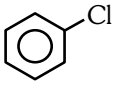
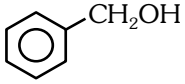
(1) $CH_3–\underset{\displaystyle CH_3}{\overset{|}{C}}H–CH_2Br$ (2) $CH_3–\underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}}–CH_2Br$

(3) $CH_3–CH_2Br$ (4) $CH_3–CH_2–CH_2Br$

**HD0240**

**9.** Which one of the following is most reactive towards electrophilic attack ?

(1)  (2) 

(3)  (4) 

**AH0241**

**10.** The relative reactivities of acyl compounds towards nucleophillic substitution are in the order of :-

(1) Acid anhydride>Amide > Ester >Acyl chloride

(2) Acyl chloride >Ester>Acid anhydride > Amide

(3) Acyl chloride >Acid anhydride >Ester> Amide

(4) Ester >Acyl chloride>Amide >Acid anhydride

**CA0242**

## AIPMT 2009

**11.** Benzene reacts with $CH_3Cl$ in the presence of anhydrous $AlCl_3$ to form :-

(1) Xylene (2) Toluene

(3) Chlorobenzene (4) Benzylchloride

**AH0243**

**12.** Nitrobenzene can be prepared from benzene by using a mixture of conc. $HNO_3$ and conc. $H_2SO_4$. In the mixture, nitric acid acts as a/an :-

(1) Catalyst (2) Reducing agent

(3) Acid (4) Base

**AH0244**

**13.** Which of the following reactions is an example of nucleophilic substitution reaction ?

(1) $RX + Mg \longrightarrow RMgX$

(2) $RX + KOH \longrightarrow ROH + KX$

(3) $2RX + 2Na \longrightarrow R - R + 2NaX$

(4) $RX + H_2 \longrightarrow RH + HX$

**HD0245**

## AIPMT 2010

**14.** Which one is most reactive towards $S_N^1$reaction?

(1) $C_6H_5CH_2Br$

(2) $C_6H_5CH(C_6H_5)Br$

(3) $C_6H_5CH(CH_3)Br$

(4) $C_6H_5C(CH_3)(C_6H_5)Br$

**HD0246**

**15.** Among the given compounds, the most susceptible to nucleophilic attack at the carbonyl group is :-

(1) $CH_3COCl$

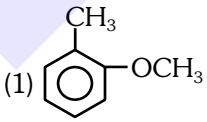
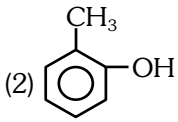
(2) $CH_3COOCH_3$

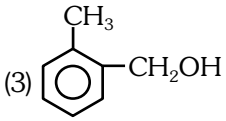
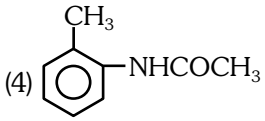
(3) $CH_3CONH_2$

(4) $CH_3COOCOCH_3$

**CA0247**

**16.** Which one is most reactive towards electrophilic reagent ?

(1)  (2) 

(3)  (4) 

**AH0248**

**17.** The reaction of toluene with $Cl_2$ inpresence of $FeCl_3$ gives 'X' and reaction in presence of light gives 'Y'. Thus, 'X' and 'Y' are :-

(1) X = Benzyl chloride,
Y = m–chlorotoluene

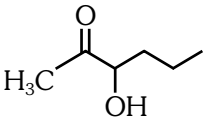
(2) X = Benzal chloride,
Y = o–chlorotoluene

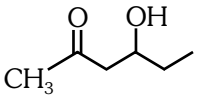
(3) X = m–chlorotoluene,
Y = p–chlorotoluene

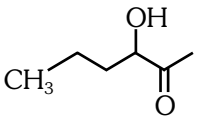
(4) X = o– and p–chlorotoluene
Y = Trichloromethyl benzene

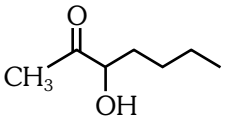
**AH0249**

**18.** Which one of the following compounds will be most readily dehydrated ?

(1) 

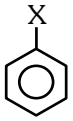
(2) 

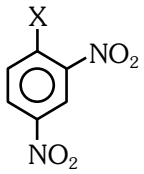
(3) 

(4) 

**HD0250**

**19.** The correct order of increasing reactivity of C–X bond towards nucleophile in the following compounds is :-


(I)


(II)

$(CH_3)_3C–X$
(III)

$(CH_3)_2CH–X$
(IV)

(1) III < II < I < IV
(2) I < II < IV < III
(3) II < III < I < IV
(4) IV < III < I < II

**HD0251**

## AIPMT Pre-2011

**20.** Which one is a nucleophilic substitution reaction among the following ?

(1) $CH_3–CH=CH_2 + H_2O \xrightarrow{H^+} CH_3–\underset{\displaystyle OH}{\underset{|}{CH}}–CH_3$

(2) $RCHO + R'MgX \longrightarrow R–\underset{\displaystyle OH}{\underset{|}{CH}}–R'$

(3) $CH_3–CH_2–\underset{\displaystyle CH_3}{\underset{|}{CH}}–CH_2Br + NH_3 \longrightarrow$

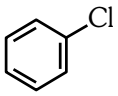
$CH_3–CH_2–\underset{\displaystyle CH_3}{\underset{|}{CH}}–\ CH_2NH_2$

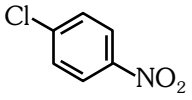
(4) $CH_3CHO + HCN \longrightarrow CH_3CH(OH)CN$

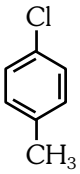
**HD0255**

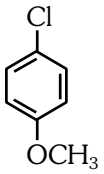
## AIPMT Mains-2011

**21.** Which of the following compounds undergoes nucleophilic substitution reaction most easily ?

(1) 

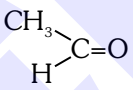
(2) 

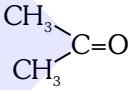
(3) 

(4) 

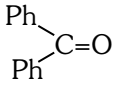
**HD0256**

**22.** The order of reactivity of phenyl magnesium bromide (PhMgBr) with the following compounds :-


(I)


(II)

and


(III)

(1) I > II > III
(2) III > II > I
(3) II > I > III
(4) I > III > II

**CC0257**

**23.** Consider the reaction :

(i) $(CH_3)_2CH–CH_2Br \xrightarrow{C_2H_5OH} (CH_3)_2CH–CH_2OC_2H_5 + HBr$

(ii) $(CH_3)_2CH–CH_2Br \xrightarrow{C_2H_5O^-} (CH_3)_2CH–CH_2OC_2H_5 + Br^-$

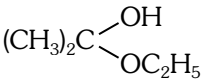
The mechanisms of reaction (i) and (ii) are respectively :-

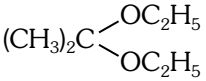
(1) $S_{N^2}$ and $S_{N^1}$
(2) $S_{N^1}$ and $S_{N^2}$
(3) $S_{N^1}$ and $S_{N^1}$
(4) $S_{N^2}$ and $S_{N^2}$

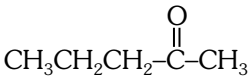
**HD0258**

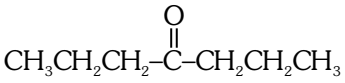
## AIPMT Pre.-2012

**24.** Acetone is treated with excess of ethanol in the presence of hydrochloric acid. The product obtained is:

(1) 

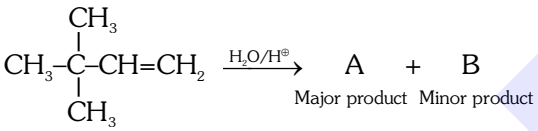
(2) 

(3) 

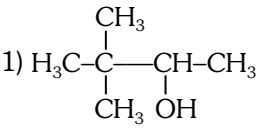
(4) 

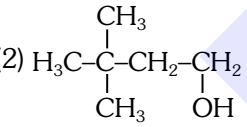
**CC0261**

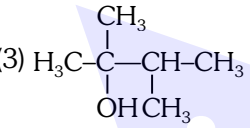
**25.** In the following reaction:

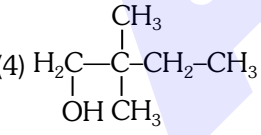



The major product is :-

(1) 

(2) 

(3) 

(4) 

**HC0262**

**26.** Among the following compounds the one that is most reactive towards electrophilic nitration is:

(1) Toluene

(2) Benzene

(3) Benzoic Acid

(4) Nitrobenzene

**AH0263**

## NEET-UG 2013

**27.** Which of the following compounds will not undergo Friedal-Craft's reaction easily :-

(1) Toluene

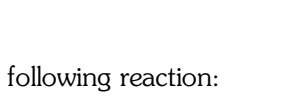
(2) Cumene

(3) Xylene

(4) Nitrobenzene

**AH0264**

**28.** Among the following ethers, which one will produce methyl alcohol on treatement with hot concentrated HI ?

(1) 

(2) 

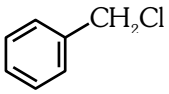
(3) 

(4) 

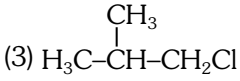
**AE0265**

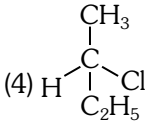
## AIPMT 2014

**29.** Which of the following compounds will undergo racemisation when hydrolysed by solution of KOH

(1) 

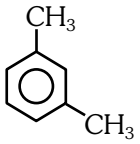
(2) 

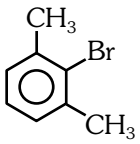
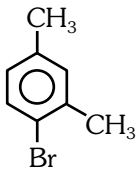
(3) 

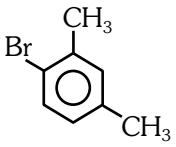
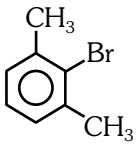
(4) 

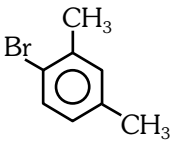
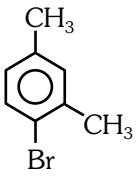
**HD0269**

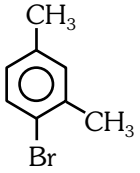
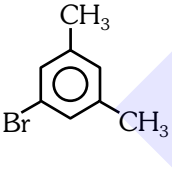
**30.** What products are formed when the following compound is treated with $Br_2$ in the presence of $FeBr_3$ ?



(1)  and 

(2)  and 

(3)  and 

(4)  and 

**AH0270**

**31.** Identify Z in the sequence of reactions:

$CH_3CH_2CH{=}CH_2 \xrightarrow{HBr/H_2O_2} Y \xrightarrow{C_2H_5ONa} Z$

(1) $CH_3{-}(CH_2)_3{-}O{-}CH_2CH_3$

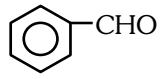
(2) $(CH_3)_2CH_2{-}O{-}CH_2CH_3$

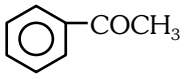
(3) $CH_3(CH_2)_4{-}O{-}CH_3$

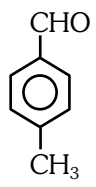
(4) $CH_3CH_2{-}CH(CH_3){-}O{-}CH_2CH_3$

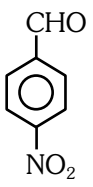
**HC0271**

**32.** Which one is most reactive towards Nucleophilic addition reaction?

(1) 

(2) 

(3) 

(4) 

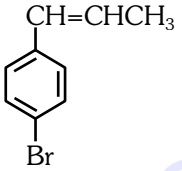
**CC0272**

**AIPMT 2015**

**33.** The reaction of $C_6H_5CH = CHCH_3$ with HBr produces:-

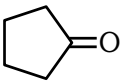
(1) $C_6H_5CH_2\underset{\displaystyle Br}{\underset{|}{C}}HCH_3$

(2) $C_6H_5CH_2CH_2CH_2Br$

(3) 

(4) $C_6H_5\underset{\displaystyle Br}{\underset{|}{C}}HCH_2CH_3$

**HC0277**

**34.** Treatment of cyclopentanone  with methyl lithium gives which of the following species ?

(1) Cyclopentanonyl cation

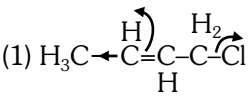
(2) Cyclopentanonyl radical

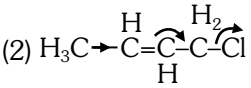
(3) Cyclopentanonyl biradical

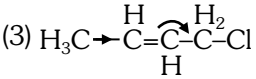
(4) Cyclopentanonyl anion

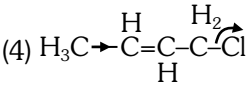
**CC0278**

**35.** Which of the following is the most **correct** electron displacement for a nucleophilic reaction to take place?

(1) 

(2) 

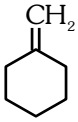
(3) 

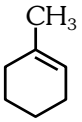
(4) 

**GC0084**

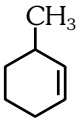
## Re-AIPMT 2015

**36.** In the reaction with HCl, an alkene reacts in accordance with the Markovnikov's rule, to give a product 1–chloro–1–methylcyclohexane. The possible alkene is :-

(1) 

(2) 

(3) (1) and (2)

(4) 

**HC0279**

**37.** Reaction of carbonyl compound with one of the following reagents involves nucleophilic addition followed by elimination of water. The reagent is :

(1) hydrocyanic acid

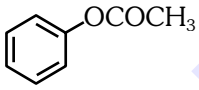
(2) sodium hydrogen sulphite

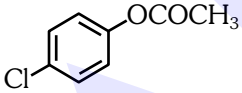
(3) a Grignard reagent

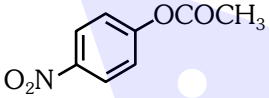
(4) hydrazine in presence of feebly acidic solution

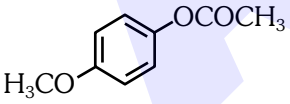
**CC0280**

**38.** Which one of the following esters gets hydrolysed *most easily* under alkaline conditions?

(1) 

(2) 

(3) 

(4) 

**CA0281**

**39.** In an $S_N1$ reaction on chiral centres, there is :

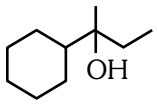
(1) 100% retention

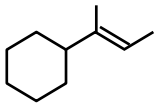
(2) 100% inversion

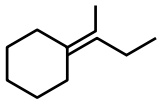
(3) 100% racemization

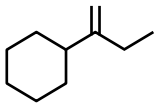
(4) inversion more than retention leading to partial recemization

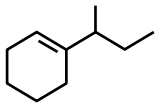
**HD0282**

**40.** Which of the following is not the product of dehydration of  ?

(1) 

(2) 

(3) 

(4) 

**HD0283**

**41.** Which of the following reaction(s) can be used for the preparation of alkyl halides ?

(I) $CH_3CH_2OH + HCl \xrightarrow{anh.ZnCl_2}$

(II) $CH_3CH_2OH + HCl \longrightarrow$

(III) $(CH_3)_3COH + HCl \longrightarrow$

(IV) $(CH_3)_2CHOH + HCl \xrightarrow{anh.ZnCl_2}$

(1) (IV) only

(2) (III) and (IV) only

(3) (I), (III) and (IV) only

(4) (I) and (II) only

**AE0284**

## NEET-I 2016

**42.** In the reaction

$$H{-}C{\equiv}CH \xrightarrow[(2)\,CH_3CH_2Br]{(1)\,NaNH_2\,/\,liq.NH_3} X \xrightarrow[(2)\,CH_3CH_2Br]{(1)\,NaNH_2\,/\,liq.NH_3} Y$$

X and Y are :

(1) X = 1-Butyne ; Y = 3-Hexyne

(2) X = 2-Butyne ; Y = 3-Hexyne

(3) X = 2-Butyne ; Y = 2-Hexyne

(4) X = 1-Butyne ; Y = 2-Hexyne

**HD0293**

**43.** Which of the following reagents would distinguish cis-cyclopentane-1,2-diol from its trans-isomer?

(1) Acetone

(2) Ozone

(3) $MnO_2$

(4) Aluminium isopropoxide

**CC0294**

**44.** The product formed by the reaction of an aldehyde with a primary amine is :-

(1) Schiff base (2) Ketone

(3) Carboxylic acid (4) Aromatic acid

**CC0295**

**45.** Consider the nitration of benzene using mixed conc. $H_2SO_4$ and $HNO_3$. If a large amount of $KHSO_4$ is added to the mixture, the rate of nitration will be:-

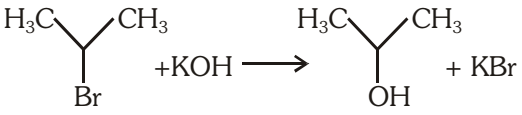
(1) faster (2) slower

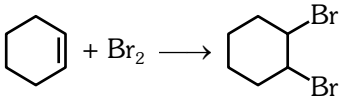
(3) unchanged (4) doubled

**AH0296**

**46.** For the following reactions :-

(a) $CH_3CH_2CH_2Br + KOH \rightarrow CH_3CH{=}CH_2 + KBr + H_2O$

(b) 

(c) 

Which of the following statement is **correct** ?

(1) (a) and (b) are elimination reaction and (c) is addition reaction

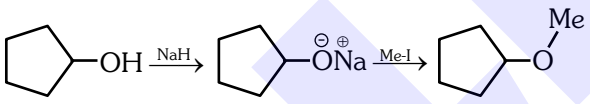
(2) (a) is elimination, (b) is substitution and (c) is addition reaction

(3) (a) is elimination, (b) and (c) are substitution reactions

(4) (a) is substitution, (b) and (c) are addition reaction

**HD0297**

**47.** The reaction



Can be classified as :-

(1) Williamson ether synthesis reaction

(2) Alcohol formation reaction

(3) Dehydration reaction

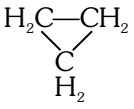
(4) Williamson alcohol synthesis reaction

**HD0298**

## NEET-II 2016

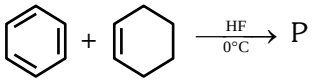
**48.** Which of the following compounds shall not produced propene by reaction with HBr followed by elimination or direct only by elimination reaction ?

(1) $H_2C{=}C{=}O$ (2) $H_3C{-}\overset{H_2}{\overset{|}{C}}{-}CH_2Br$

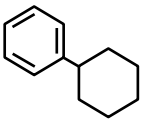
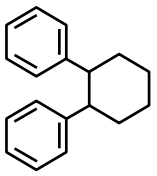
(3)  (4) $H_3C{-}\overset{H_2}{\overset{|}{C}}{-}CH_2OH$

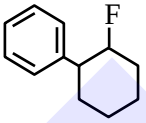
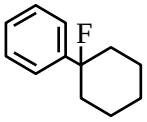
**HD0299**

**49.** In the given reaction



the product P is :-

(1)  (2) 

(3)  (4) 

**AH0300**

**50.** The compound that will react most readily with gaseous bromine has the formula

(1) $C_4H_{10}$ (2) $C_2H_4$

(3) $C_3H_6$ (4) $C_2H_2$

**HC0301**

**51.** Which of the following can be used as the halide component for Friedel-Crafts reaction ?

(1) Chloroethene

(2) Isopropyl chloride

(3) Chlorobenzene

(4) Bromobenzene

**AH0302**

**52.** Consider the reaction

$CH_3CH_2CH_2Br + NaCN \rightarrow CH_3CH_2CH_2CN + NaBr$

This reaction will be the fastest in

(1) N,N'-dimethylformamide (DMF)

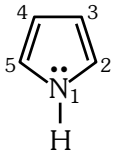
(2) water

(3) ethanol

(4) methanol

**HD0303**

**53.** In pyrrole



The electron density is maximum on :-

(1) 2 and 4 (2) 2 and 5

(3) 2 and 3 (4) 4 and 4

**GC0091**

## NEET(UG) 2017

**54.** Predict the correct intermediate and product in the following reaction :

$H_3C-C\equiv CH \xrightarrow[HgSO_4]{H_2O,\ H_2SO_4}$ Intermediate (A) $\longrightarrow$ product (B)

(1) A : $H_3C-\underset{\underset{OH}{|}}{C}=CH_2$ B : $H_3C-\underset{\underset{SO_4}{|}}{C}=CH_2$

(2) A : $H_3C-\underset{\underset{O}{||}}{C}-CH_3$ B : $H_3C-C\equiv CH$

(3) A : $H_3C-\underset{\underset{OH}{|}}{C}=CH_2$ B : $H_3C-\underset{\underset{O}{||}}{C}-CH_3$

(4) A : $H_3C-\underset{\underset{SO_4}{|}}{C}=CH_2$ B : $H_3C-\underset{\underset{O}{||}}{C}-CH_3$

**CC0311**

## NEET(UG) 2018

**55.** Nitration of aniline in strong acidic medium also gives m-nitroaniline because

(1) In spite of substituents nitro group always goes to only m-position.

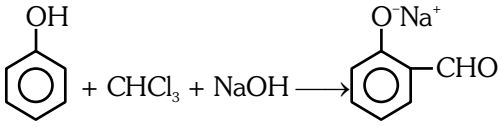
(2) In electrophilic substitution reactions amino group is meta directive.

(3) In absence of substituents nitro group always goes to m-position

(4) In acidic (strong) medium aniline is present as anilinium ion.

**AH0315**

**56.** In the reaction



the electrophile involved is

(1) dichloromethyl cation ($\overset{\oplus}{C}HCl_2$)

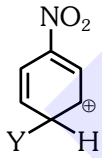
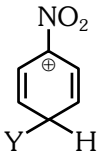
(2) formyl cation ($\overset{\oplus}{C}HO$)

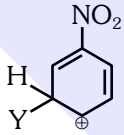
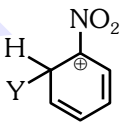
(3) dichloromethyl anion ($\overset{\ominus}{C}HCl_2$)

(4) dichlorocarbene ($:CCl_2$)

**AE0316**

**57.** Which of the following carbocations is expected to be most stable ?

(1)  (2) 

(3)  (4) 

**GC0317**

## NEET(UG) 2020

**58.** Reaction between acetone and methylmagnesium chloride followed by hydrolysis will give :

(1) Isobutyl alcohol

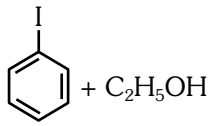
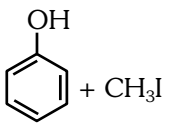
(2) Isopropyl alcohol

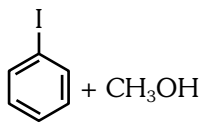
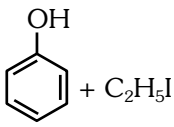
(3) Sec. butyl alcohol

(4) Tert. butyl alcohol

**AE0416**

**59.** Anisole on cleavage with HI gives:

(1)  (2) 

(3)  (4) 

**AE0417**

**60.** Elimination reaction of 2-Bromo-pentane to form pent-2-ene is:

(a) β-Elimination reaction

(b) Follow Zaitsev rule

(c) Dehydrohalogenation reaction

(d) Dehydration reaction

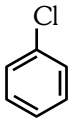
(1) (a), (b), (d) (2) (a), (b), (c)

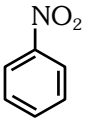
(3) (a), (c), (d) (4) (b), (c), (d)

**HD0418**

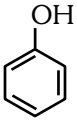
## NEET(UG) 2020 (COVID-19)

**61.** Which of the following compound is most reactive in electrophilic aromatic substitution ?

(1) 

(2) 

(3) 

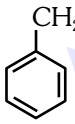
(4) 

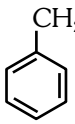
**AH0419**

**62.** Which of the following will **NOT** undergo $S_N1$ reaction with $\bar{O}H$ ?

(1) $CH_2 = CH - CH_2Cl$

(2) $(CH_3)_3\ CCl$

(3) 

(4) 

**HD0420**

**63.** Which of the following is a free radical substitution reaction ?

(1) Benzene with $Br_2/AlCl_3$

(2) Acetylene with HBr

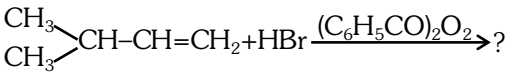
(3) Methane with $Br_2/hv$

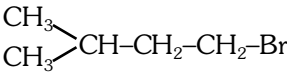
(4) Propene with $HBr/(C_6H_5COO)_2$

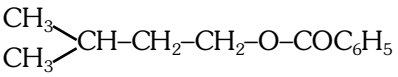
**HC0421**

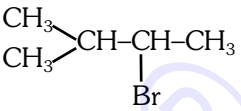
## NEET(UG) 2021

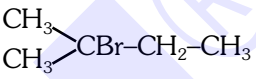
**64.** The major product of the following chemical reaction is:



(1) 

(2) 

(3) 

(4) 

**HC0422**

## NEET (UG) 2022

**65.** The incorrect statement regarding chirality is:

(1) The product obtained by $S_N2$ reaction of haloalkane having chirality at the reactive site shows inversion of configuration,

(2) Enantiomers are superimposable mirror images of each other.

(3) A racemic mixture shows zero optical rotation.

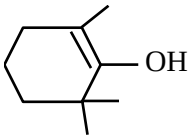
(4) $S_N1$ reaction yields 1 : 1 mixture of both enantiomers.

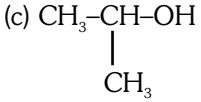
**HD0432**

## NEET (UG) 2022 (Overseas)

**66.** The increasing order of reactivity of the following compounds towards acid catalysed dehydration is

(a) $CH_3–CH_2–OH$

(b) 

(c) 

(d) $CH_3–C(CH_3)_2–OH$

Choose the **correct answer** from the options given below :

(1) (b) < (a) < (c) < (d) (2) (a) < (c) < (d) < (b)

(3) (c) < (a) < (b) < (d) (4) (b) < (c) < (a) < (d)

**AE0433**

**Re-NEET (UG) 2022**

**67.** Given below are two statements : one is labelled as **Assertion (A)** and the other is labelled as **Reason (R).**

**Assertion (A) :** Chlorine is an electron withdrawing group but it is ortho, para directing in electrophilic aromatic substitution.

**Reason (R) :**

Inductive effect of chlorine destabilises the intermediate carbocation formed during the electrophilic substitution, however due to the more pronounced resonance effect, the halogen stabilises the carbocation at ortho and para positions.

In the light of the above statements, choose the most appropriate answer from the options given below :

(1) Both **(A)** and **(R)** are correct and **(R)** is the correct explanation of **(A)**

(2) Both **(A)** and **(R)** are correct but **(R)** is not the correct explanation of **(A)**

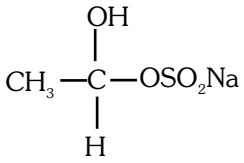
(3) **(A)** is correct but **(R)** is not correct

(4) **(A)** is not correct but **(R)** is correct.

**AH0434**

**68.** Which of the following reactions is not an example for nucleophilic addition – elimination reaction ?

(1) $CH_3CHO + NaHSO_3 \rightleftharpoons$



(2) $CH_3CHO + NH_2OH \rightleftharpoons CH_3CH = N–OH+H_2O$

(3) $CH_3CHO+C_6H_5NHNH_2 \rightleftharpoons CH_3CH=N–NHC_6H_5+H_2O$

(4) $CH_3CHO + NH_3 \rightleftharpoons CH_3CH= NH + H_2O$

**CC0435**

## EXERCISE-II (Previous Year Questions) ANSWER KEY

| Que. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ans. | **4** | **4** | **3** | **3** | **1** | **3** | **1** | **3** | **2** | **3** | **2** | **4** | **2** | **4** | **1** |
| Que. | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| Ans. | **2** | **4** | **2** | **2** | **3** | **2** | **1** | **4** | **2** | **3** | **1** | **4** | **4** | **4** | **3** |
| Que. | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 |
| Ans. | **1** | **4** | **4** | **4** | **2** | **3** | **4** | **3** | **4** | **4** | **3** | **1** | **1** | **1** | **2** |
| Que. | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| Ans. | **2** | **1** | **1** | **1** | **3** | **2** | **1** | **2** | **3** | **4** | **4** | **3** | **4** | **2** | **2** |
| Que. | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | | | | | | | |
| Ans. | **4** | **3** | **3** | **1** | **2** | **1** | **1** | **1** | | | | | | | |

EXERCISE-III (Analytical Questions) Master Your Understanding

**1.** $Ph-CH=\overset{CH_3}{\overset{|}{C}}-CH_3 + HBr \xrightarrow{Peroxide} (X)$

'X' is

(1) $Ph-\overset{Br}{\overset{|}{CH}}-\overset{CH_3}{\overset{|}{CH}}-CH_3$

(2) $Ph-CH_2-\overset{Br}{\overset{|}{C}}(CH_3)_2$

(3) $Ph-CH_2-\underset{CH_3}{\overset{|}{CH}}-CH_2-Br$

(4) $Ph-CH=\underset{CH_3}{\overset{|}{C}}-CH_2-Br$

**HC0335**

**2.** $CH_3-\overset{CH_3}{\overset{|}{CH}}-CH=CH_2 \xrightarrow{\overset{\oplus}{D}/H_2O} A;$

A (major product) is

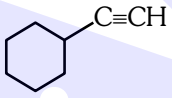
(1) $CH_3-\underset{CH_3}{\overset{|}{CH}}-CHD-CH_2-OH$

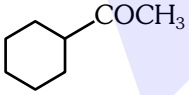
(2) $CH_3-\underset{CH_3}{\overset{|}{CH}}-\underset{OH}{\overset{|}{CH}}-CH_2-D$

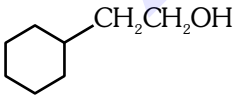
(3) $CH_3-\underset{CH_3}{\overset{|}{C}}(OH)\,CHDCH_3$

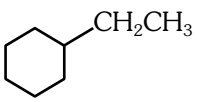
(4) $CH_3-\underset{CH_3}{\overset{|}{C}}(OH)\,CH_2-CH_2-D$

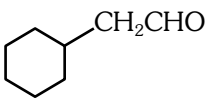
**HC0337**

**3.** Hydration of  in presence of $H_2SO_4/HgSO_4$ gives

(1) 

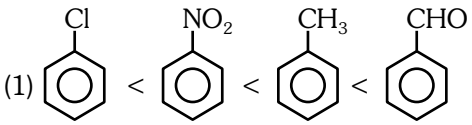
(2) 

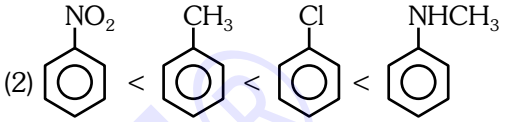
(3) 

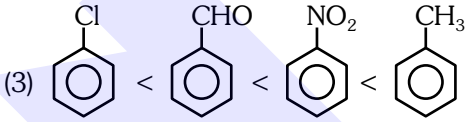
(4) 

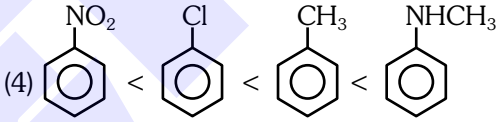
**HD0339**

**4.** Identify correct order of reactivity for electrophilic substitution reaction of the following compounds :–

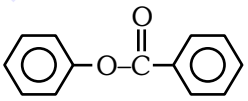
(1) 

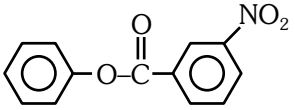
(2) 

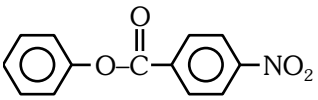
(3) 

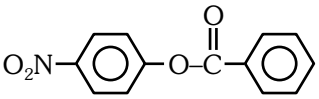
(4) 

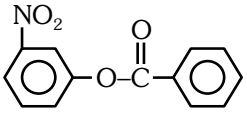
**AH0340**

**5.**  Product is :-

(1) 

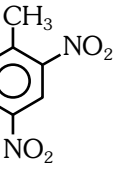
(2) 

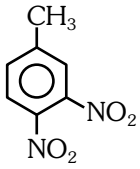
(3) 

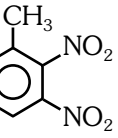
(4) 

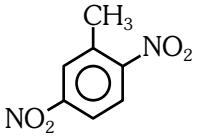
**AH0341**

**6.** p- nitro toluene on further nitration gives

(1) 

(2) 

(3) 

(4) 

**AH0342**

**7.** Which of the following reaction gives t-butyl benzene:

(1) $C_6H_6$ + t–butyl chloride, $\xrightarrow{AlCl_3}$

(2) $C_6H_6 + (CH_3)_2C{=}CH_2 \xrightarrow{HF}$

(3) $C_6H_6$ + t–butyl alcohol $\xrightarrow{H_2SO_4}$

(4) All of them

**AH0343**

**8.** Halogenation of alkanes gives a mixture of monohalo products. The ease of substitution follows the order

(1) Tertiary H > primary H > secondary H

(2) Primary H < secondary H < tertiary H

(3) Primary H > secondary H > tertiary H

(4) Secondary H > tertiary H < primary H

**GC0344**

**9.** The number of different substitution products possible when ethane is allowed to react with bromine in sunlight are

(1) 9 (2) 6 (3) 8 (4) 5

**HC0345**

**10.** Chlorination of toluene in the presence of light and heat followed by treatment with aqueous NaOH gives

(1) o-cresol

(2) p-cresol

(3) 2, 4-dihydroxy toluene

(4) Benzyl alcohol

**HC0346**

**11.** Which gives maximum yield of $C_2H_5Cl$

(1) $C_2H_6 + Cl_2 \xrightarrow[\text{excess}]{hv,\ light} C_2H_5Cl + HCl$

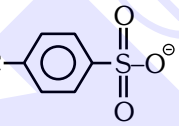
(2) $C_2H_6 + Cl_2 \xrightarrow[\text{excess}]{hv\ light} C_2H_5Cl + HCl$

(3) $C_2H_6 + Cl_2 \xrightarrow{hv\ light} C_2H_5Cl$

(4) $C_2H_6 + Cl_2 \xrightarrow{Dark} C_2H_5Cl + HCl^-$

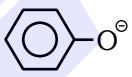
**HC0347**

**12.** Which of the following has maximum nucleophilicity :-

(1) 

(2) $CH_3 - O^{\ominus}$

(3) $CF_3{-}\underset{\underset{O}{\|}}{C}{-}O^{\ominus}$

(4) 

**HD0348**

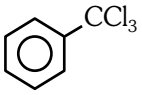
**13.** Alkaline hydrolysis of 2,2-dichloropropane gives

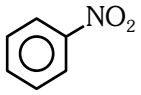
(1) Acetone (2) 2,2-propane-diol

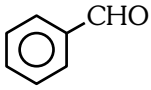
(3) Propane (4) Propan-2-ol

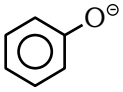
**HD0350**

**14.** Electrophile $\overset{\oplus}{N}O_2$ attacks the following :

(I) 

(II) 

(III) 

(IV) 

in which cases $\overset{\oplus}{N}O_2$ will attack at meta position

(1) II and IV

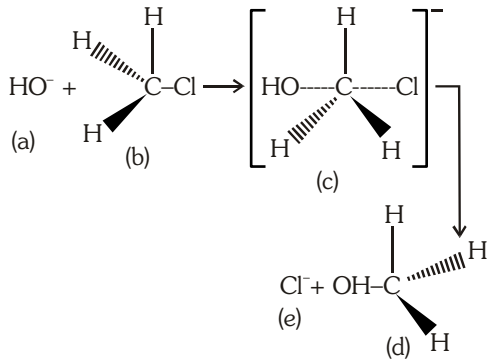
(2) I, II and III

(3) III and IV

(4) I only

**AH0351**

**15.** Which of the following statement is correct for $SN^2$ mechanism




(1) In (c) carbon atom is $sp^3$ hybridized

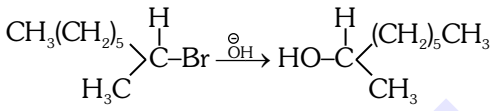
(2) In (c) carbon atom is $sp^2$ hybridised

(3) (a) and (e) are electrophiles

(4) (c) is more stable then (d)

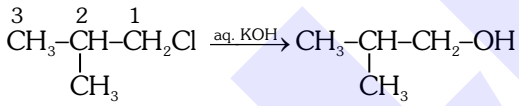
**HD0352**

**16.** Following reaction is




(1) $E_1$ (2) $S_N1$ (3) $E_2$ (4) $S_N2$

**HD0353**

**17.** 


In the above reaction the attack of a nucleophile would be from which side

(1) On the front side of Cl of $C_1$ carbon

(2) On $C_2$ carbon

(3) On the rear side of Cl of $C_1$ carbon

(4) On $C_3$ carbon

**HD0354**

**18.** Which of the following ether can not be prepared by Williamson's method :-

(1) Ditertbutyl ether

(2) Ethyl-tert-butyl ether

(3) Anisole

(4) 1 & 2 Both

**AE0355**

**19.** Major product of the reaction :-

$(CH_3)_3C–Cl + C_2H_5ONa \longrightarrow$

would be :-

(1) $(CH_3)_2C–OC_2H_5$

(2) $(CH_3)_3C–C_2H_5$

(3) $(CH_3)_2C=CH_2$

(4) $CH_3–CH=CH–C_2H_5$

**HD0357**

**20.** The major product obtained on treatment of $CH_3CH_2CH(F)CH_3$ with $CH_3O^-/CH_3OH$ is

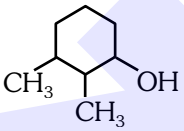
(1) $CH_3CH_2CH(OCH_3)CH_3$

(2) $CH_3CH=CHCH_3$

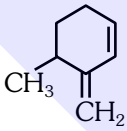
(3) $CH_3CH_2CH=CH_2$

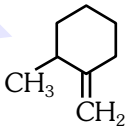
(4) $CH_3CH_2CH_2CH_2OCH_3$

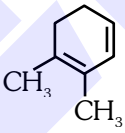
**HD0359**

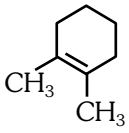
**21.** 

X (major) 'A' is

(1) 


(2) 


(3) 


(4) 


**HD0361**

**22.** In following two columns :

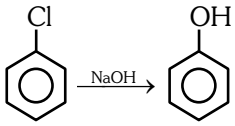
**Column-I**

(a) $CH_3–CH_2–Br + HS^- \rightarrow CH_3–CH_2–SH + Br^-$

(b) $(CH_3)_2C=CH_2 + HOCl \rightarrow (CH_3)_2\overset{OH}{\overset{|}{C}}–CH_2–Cl$

(c) $CH_3–CH_2–Br + {}^-OH \rightarrow CH_2=CH_2 + H_2O + Br^-$

(d) $(CH_3)_3C–CH_2–OH + H–Br \rightarrow (CH_3)_2CBrCH_2–CH_3 + H_2O$

(e) 


**Column-II**

(1) Nucleophilic substitution

(2) Elimination

(3) Electrophilic substitution

(4) Electrophilic additon

(5) Rearrangement reaction

(1) a, d $\rightarrow$ 1 , b $\rightarrow$ 4, c $\rightarrow$ 2 , e $\rightarrow$ 1

(2) e, a, d $\rightarrow$ 1 , b $\rightarrow$ 4, c $\rightarrow$ 3

(3) a, e $\rightarrow$ 1 , b $\rightarrow$ 4, c $\rightarrow$ 2 , d $\rightarrow$ 5

(4) a, c $\rightarrow$ 1 , b $\rightarrow$ 4, e $\rightarrow$ 3 , d $\rightarrow$ 5

**HD0403**

**23.** Which is not correct about nitration ?

(1) $\overset{\oplus}{N}O_2$ is an attacking electrophile

(2) In general, nitration is monosubstitution process

(3) In nitrating mix, $HNO_3$ acts as acid, & $H_2SO_4$ acts as base

(4) In nitrating mix $HNO_3$ acts as base & $H_2SO_4$ acts as an acid

**AH0404**

## EXERCISE-III (Analytical Questions) ANSWER KEY

| Que. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ans. | **2** | **4** | **1** | **4** | **3** | **1** | **4** | **2** | **1** | **4** | **2** | **2** | **1** | **2** | **2** |
| Que. | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | | | | | | | |
| Ans. | **4** | **3** | **1** | **3** | **3** | **4** | **1** | **3** | | | | | | | |