PRE-MEDICAL

ORGANIC CHEMISTRY

ENTHUSIAST | LEADER | ACHIEVER

EXERCISE

Halogen Derivatives

ENGLISH MEDIUM

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

GENERAL METHOD OF PREPARATION

1. Alkyl halides can be obtained by all methods excepts

(1) $CH_3—CH_2—OH + HCl \xrightarrow{ZnCl_2}$

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

(3) $C_2H_5OH + NaCl \longrightarrow$

(4) $CH_3COOAg + Br_2 / CCl_4 \xrightarrow{h\nu}$

HD0001

2. Which of the following will not give iodoform test

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

(2) $C_2H_5-\underset{\underset{O}{\|}}{C}-C_2H_5$

(3) $H-CH_2-\underset{\underset{OH}{|}}{CH}-C_2H_5$

(4) $I-CH_2-\underset{\underset{O}{\|}}{C}-CH_2-H$

HD0002

3. Which of the following product is obtained when bleaching powder is distilled with acetone

(1) CCl_4 (2) $CHCl_3$

(3) $CH_3—CH_3$ (4) All

HD0003

4. Which will give yellow ppt. with iodine and alkali

(1) Propan–2–ol

(2) Benzophenone

(3) Methyl acetate

(4) Acetamide

HD0004

PHYSICAL PROPERTIES

5. Which of the following has the highest boiling point

(1) CH_3CH_2I (2) CH_3Cl

(3) CH_3I (4) CH_3Br

HD0005

6. A compound containing two –OH groups attached with one carbon atoms is unstable but which one of the following is stable

(1) $CH_3CH(OH)_2$

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

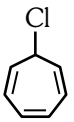
(3) $Cl_3C-CH(OH)_2$

(4) All

CC0006

CHEMICAL PROPERTIES

7. Arrange the following compounds in decreasing order of reactivity in S_N1 reaction :-

(a) $Ph-CH_2-Cl$ (b) 

(c)  (d) $CH_3-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}-CH_2-Cl$

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

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

HD0007

8. The purity of $CHCl_3$ can be checked by

(1) treating $CHCl_3$ by NaOH

(2) treating $CHCl_3$ by HCl

(3) treating $CHCl_3$ with aq. $AgNO_3$

(4) treating $CHCl_3$ by $C_2H_5–OH$

HD0009

9. Pure $CHCl_3$ and pure CHI_3 can be distinguished by

(1) treating with litmus paper

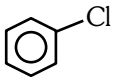
(2) treating with aq. KOH

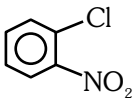
(3) treating with HCl

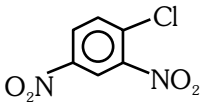
(4) treating with aq. $AgNO_3$

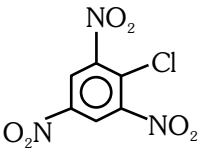
HD0010

10. Which of the following undergoes hydrolysis most easily

(1) 

(2) 

(3) 

(4) 

HD0012

11. Which of the following is used as insecticide

(1) D.D.T. (2) Chloretone

(3) $CHCl_3$ (4) All of them

AH0013

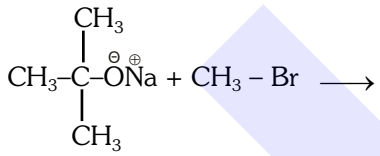
12. Which of the following when heated with KOH and primary amine gives carbylamine test

(1) $CHCl_3$ (2) CH_2Cl_2

(3) CH_3OH (4) CCl_4

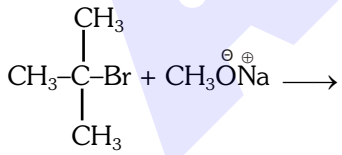
AM0014

13. Which reaction gives elimination as a major product

(1) 

(2) $CH_3–CH_2–Br + NaCN \xrightarrow{DMSO}$

(3) $CH_3–CH_2–Br + NaI \xrightarrow{Dry\ acetone}$

(4) 

HD0015

14. When alkyl magnesium halide reacts with R'-NH_2, the product is

(1) R—R (2) R— H

(3) R_2NH (4) R—X

HC0018

15. Chloroform on reaction with acetone gives:–

(1) Acetylene

(2) Chloretone

(3) Nitrochloroform

(4) Chloroacetone

HD0019

16. Chloroform reacts with aniline and aqueous KOH gives :-

(1) Ph–N≡C (Phenyl isocyanide)

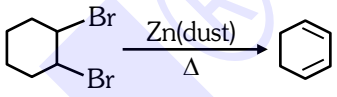
(2) Benzene

(3) Phenyl cyanide

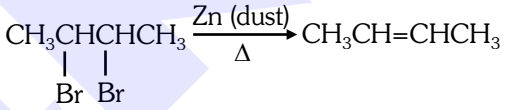
(4) None of these

AM0020

17. Which reaction product is wrong (major) product

(1) 

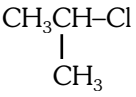
(2) $CH_3CH_2CH_2Br \xrightarrow[dry\ Acetone]{NaI} CH_3CH_2CH_2I$

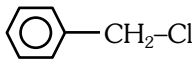
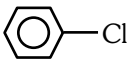
(3) 

(4) $CH_3CH_2CHCl_2 \xrightarrow[(ii)\ H^+]{(i)\ NaNH_2(excess)} CH_3C{\equiv}CH$

HD0021

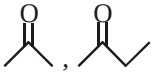
18. Which of the following undergoes nucleophilic substitution by SN1 mechanism at fastest rate :

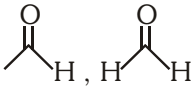
(1) $CH_3–CH_2–Cl$ (2) 

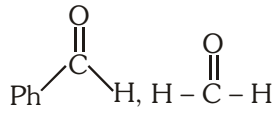
(3)  (4) 

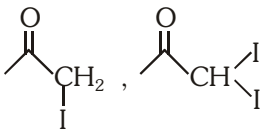
HD0022

19. Which of the following pair is differentiated by iodoform test?

(1) 

(2) 

(3) 

(4) 

HD0023

20. Identify z in the following series

$CH_2=CH_2 \xrightarrow[\Delta]{HBr} x \xrightarrow{Hydrolysis} y \xrightarrow{I_2/NaOH} z$

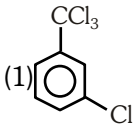
(1) C_2H_5I (2) C_2H_5OH

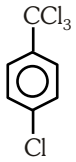
(3) CHI_3 (4) CH_3CHO

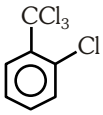
HD0024

21. $C_6H_5CCl_3 \xrightarrow[Fe]{Cl_2} X$

In the above reaction X is

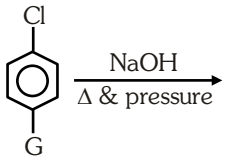
(1) 

(2) 

(3) 

(4) None of these

AH0026

22.  :-

Rate of reaction is maximum if G is :-

(1) $-OCH_3$ (2) $-CH_3$

(3) $-NO_2$ (4) –H

HD0027

23. Hydrolysis of optically active 2-bromobutane gives-

(1) (d)-butan-2-ol (2) (ℓ)-butan-2-ol

(3) (dℓ)-butan-2-ol (4) either of these

HD0055

24. When a haloalkane with β-hydrogen is heated with alcoholic solution of KOH the product and the type of mechanism is-

(1) Alcohol, S_N1

(2) Alkene, α-elimination

(3) Alcohol, S_N2

(4) Alkene, β-elimination

HD0056

25. In RMgX, C–Mg bond is-

(1) Non polar covalent

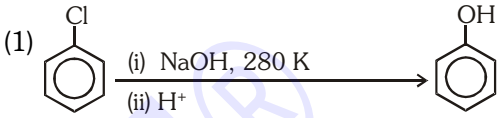
(2) Polar covalent

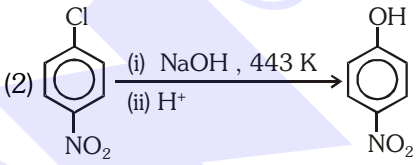
(3) Ionic

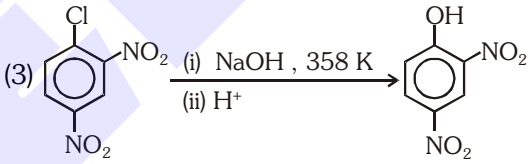
(4) Coordinate

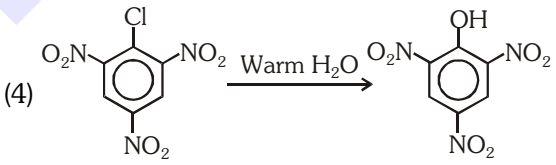
HD0057

26. The incorrect reaction is-

(1) 

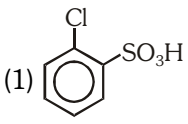
(2) 

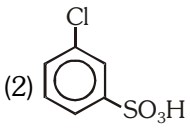
(3) 

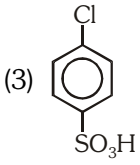
(4) 

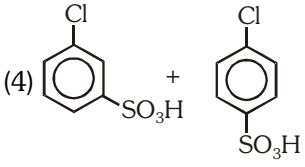
HD0058

27. 

(1) 

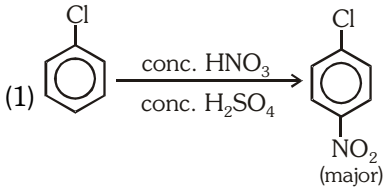
(2) 

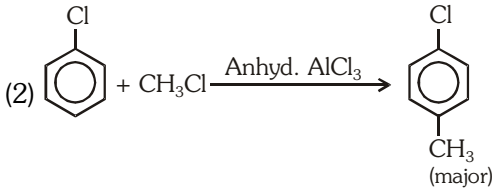
(3) 

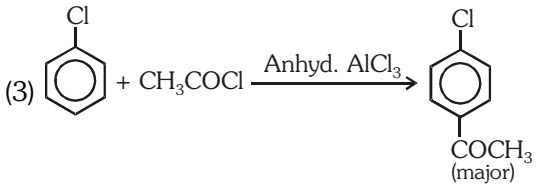
(4) 

AH0059

28. The correct reaction is -

(1) 

(2) 

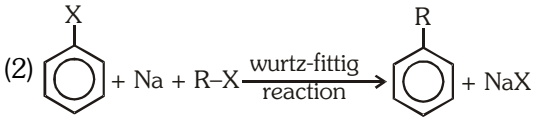
(3) 

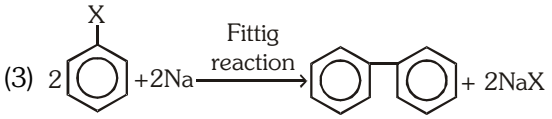
(4) All of these

AH0060

29. Which of the following is correct

(1) $2RX + 2Na \xrightarrow{\text{wurtz reaction}} R\text{–}R + 2NaX$

(2) 

(3) 

(4) All of these

HC0061

30. Incorrect match is-

(1) Iodoform - Antiseptic

(2) Pyrene - Fire extinguisher

(3) Freon 12 - aerosol propellants

(4) DDT - Fat insoluble

HD0062

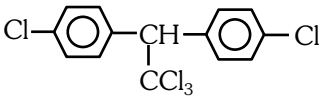
EXERCISE-I (Conceptual Questions) ANSWER KEY

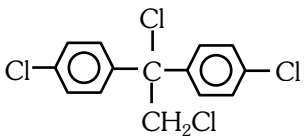
Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	3	2	2	1	1	3	4	3	4	4	1	1	4	2	2
Que.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ans.	1	1	3	2	3	1	3	3	4	2	1	3	4	4	4

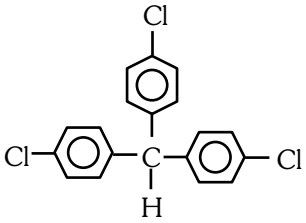
EXERCISE-II (Previous Year Questions) AIPMT/NEET

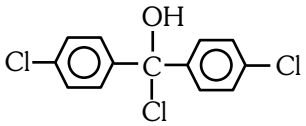
AIPMT 2009

1. Trichloroacetaldehyde, CCl_3CHO reacts with chlorobenzene in presence of sulphuric acid and produces :-

(1) 

(2) 

(3) 

(4) 

AH0029

AIPMT 2010

2. In the following reaction

$$C_6H_5CH_2Br \xrightarrow[2.H_3O^+]{1.\ Mg,\ Ether} X,$$

The product 'X' is :-

(1) $C_6H_5CH_2OH$

(2) $C_6H_5CH_3$

(3) $C_6H_5CH_2CH_2C_6H_5$

(4) $C_6H_5CH_2OCH_2C_6H_5$

HC0030

3. Following compounds are given :

(a) CH_3CH_2OH (b) CH_3COCH_3

(c) $CH_3-\underset{\displaystyle CH_3}{\overset{\displaystyle |}{CHOH}}$ (d) CH_3OH

Which of the above compound(s), on being warmed with iodine solution and NaOH, will give iodoform?

(1) Only (a) (2) (a), (b) and (c)

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

HD0031

AIPMT Mains 2012

4. Which of the following compounds will give a yellow precipitate with iodine and alkali ?

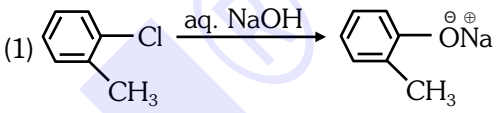
(1) Acetamide (2) Propan-1-ol

(3) Acetophenone (4) Methyl acetate

HD0033

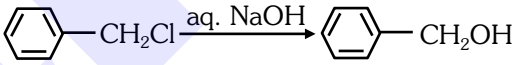
NEET(UG) 2019 (ODISHA)

5. The hydrolysis reaction that takes place at the slowest rate, among the following is :-

(1) 

(2) $H_3C-CH_2-Cl \xrightarrow{aq.\ NaOH} H_3C-CH_2-OH$

(3) $H_2C=CH-CH_2Cl \xrightarrow{aq.\ NaOH} H_2C=CH-CH_2OH$

(4) 

HD0063

NEET(UG) 2021

6. The correct sequence of bond enthalpy of 'C-X' bond is

(1) $CH_3-F < CH_3-Cl < CH_3-Br < CH_3-I$

(2) $CH_3-F > CH_3-Cl > CH_3-Br > CH_3-I$

(3) $CH_3-F < CH_3-Cl > CH_3-Br > CH_3-I$

(4) $CH_3-Cl > CH_3-F > CH_3-Br > CH_3-I$

HD0077

NEET (UG) 2021(Paper-2)

7. Which of the following alkyl halides is not suitable for Corey house synthesis of alkanes?

(1) CH3I (2) 

(3)  (4) 

HD0078

NEET(UG) 2022

8. $RMgX + CO_2 \xrightarrow[ether]{dry} Y \xrightarrow{H_3O^+} RCOOH$

What is Y in the above reaction :

(1) $R_3CO^-Mg^+X$ (2) $RCOO^-X^+$

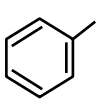
(3) $(RCOO)_2Mg$ (4) $RCOO^-Mg^+X$

CC0079

9. Which of the following is suitable to synthesize chlorobenzene ?

(1) Phenol, $NaNO_2$, HCl, CuCl

(2)  , HCl

(3)  , HCl, Heating

(4) Benzene, Cl_2, anhydrous $FeCl_3$

HD0080

Re-NEET(UG) 2022

10. Predict the order of reactivity of the following four isomers towards S_N2 reaction.

(I) $CH_3CH_2CH_2CH_2Cl$

(II) $CH_3CH_2CH(Cl)CH_3$

(III) $(CH_3)_2CHCH_2Cl$

(IV) $(CH_3)_3CCl$

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

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

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

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

HD0081

EXERCISE-II (Previous Year Questions) ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10
Ans.	1	2	2	3	1	2	4	4	4	3

EXERCISE-III (Analytical Questions) — Master Your Understanding

1. Which of the following has highest dipole moment:
(1) CH_3Cl (2) CH_3F
(3) CH_3Br (4) CH_3I

HD0040

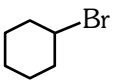
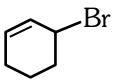
2. The final product in the reaction is

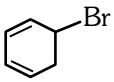
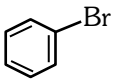
$Ph—OH + CCl_4 \xrightarrow[(2)\ H^{\oplus}]{(1)\ KOH,\ \Delta}$ product

(1) Salicylaldehyde
(2) Salicylic acid
(3) Methyl salicylate
(4) Benzyl chloride

AH0041

3. Arrange the following in order of ease of dehydrohalogenation:

(i)  (ii) 

(iii)  (iv) 

(1) (iii) > (iv) > (ii) > (i)
(2) (iii) > (ii) > (i) > (iv)
(3) (ii) > (iii) > (i) > (iv)
(4) (i) > (ii) > (iii) > (iv)

HD0042

4. The product in the following reaction is

$Ph—Cl + Fe / Br_2 \longrightarrow$ Product

(1) o–bromo-chloro benzene
(2) p–bromo-chloro benzene
(3) both the above
(4) 2,4,6–tribromo chloro benzene

AH0043

5. Isobutyl magnesium bromide with dry ether and absolute alcohol gives

(1) $CH_3–\underset{\displaystyle CH_3}{\underset{|}{CH}}–CH_2OH$ and CH_3CH_2MgBr

(2) $CH_3–\underset{\displaystyle CH_3}{\underset{|}{CH}}–CH_2—CH_2–CH_3$ and Mg (OH) Br

(3) $CH_3–\underset{\displaystyle CH_3}{\underset{|}{CH}}–CH_3$, $CH_2=CH_2$ and Mg(OH)Br

(4) $CH_3–\underset{\displaystyle CH_3}{\underset{|}{CH}}–CH_3$ and CH_3CH_2OMgBr

HC0044

6. Identify 'Z' in the following reaction series,

$CH_3.CH_2CH_2Br \xrightarrow{\text{aq. NaOH}}$ (X) $\xrightarrow[\text{Heat}]{Al_2O_3}$ (Y) $\xrightarrow{Cl_2/H_2O}$ (Z)

(1) Mixture of $CH_3–\underset{\displaystyle Cl}{\underset{|}{CH}}–\underset{\displaystyle Cl}{\underset{|}{CH_2}}$ and $CH_3–\underset{\displaystyle OH}{\underset{|}{CH}}–\underset{\displaystyle OH}{\underset{|}{CH_2}}$

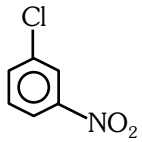
(2) $CH_3–\underset{\displaystyle OH}{\underset{|}{CH}}–\underset{\displaystyle Cl}{\underset{|}{CH_2}}$

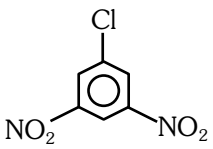
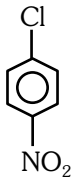
(3) $CH_3–\underset{\displaystyle Cl}{\underset{|}{CH}}–\underset{\displaystyle OH}{\underset{|}{CH_2}}$

(4) $CH_3–\underset{\displaystyle Cl}{\underset{|}{CH}}–\underset{\displaystyle Cl}{\underset{|}{CH_2}}$

HD0045

7. Arrange the following compound in increasing order of reactivity towards aromatic nucleophilic substitution reaction.

(a)  (b) 

(c)  (d) 

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

HD0046

8. Chloroform when treated with benzene in presence of anhydrous $AlCl_3$, the product formed is

(1) Chlorobenzene
(2) Toulene
(3) Mixture of ortho and para chlorotoluene
(4) Triphenyl methane

AH0047

9. Consider the following statements-

(A) In allylic halides halogen atom is bonded to an sp^3 carbon adjacent to C=C

(B) In benzylic halides halogen atom is bonded to sp^3 carbon attached to an aromatic ring

(C) In vinylic halides halogen atom is bonded to a sp^2 carbon of a C=C

(D) In aryl halides halogen atom is directly bonded to a sp^2 carbon of an aromatic ring

Which statement(s) is/are correct

(1) Only A, B, C (2) Only A, C
(3) Only A, C, D (4) All

HD0064

10. Which alkane gives 1-chloro-2,2-dimethyl propane on monochlorination-

(1) Isopentane (2) Isobutane
(3) Neopentane (4) 2,3-dimethyl butane

HD0065

11. $CH_3-CH_2-OH \xrightarrow[H_2SO_4]{NaBr} (A) \xrightarrow[\Delta]{Alc.KOH} (B) \xrightarrow{HBr} (C)$

A, B and C are respectively -

(1) $CH_3CH_2HSO_4$, $CH_2=CH_2$, $BrCH_2-CH_2-Br$
(2) CH_3-CH_2-Br, $CH_2=CH_2$, CH_3-CH_2-Br
(3) $CH_3-CH_2-OCH_2-CH_3$, $CH_2=CH_2$, $CH_3-\underset{Br}{CH_2}$
(4) $CH_2=CH_2$, CH_3-CH_2-OH, CH_3-CH_2-Br

HD0066

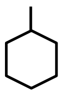
12. Correct order of rate of photo bromination for following compounds-

(I) CH_3-CH_3 (II) CD_3-CD_3

(III) $CH_3-\underset{CH_3}{\overset{CH_3}{C}}-H$

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

HD0067

13.  $\xrightarrow[hv]{Cl_2}$ Monochlorination product

Number of possible monochloro derivatives excluding stereo isomers is/are -

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

HD0068

14. Which halide ion is the best nucleophile in DMF -

(1) $F^{\ominus}$ (2) $Cl^{\ominus}$
(3) $Br^{\ominus}$ (4) $I^{\ominus}$

HD0069

15. Which of the following S_N2 reaction is the slowest-

(1) $CH_3-CH_2-CH_2-Br \xrightarrow{\overset{\ominus}{O}H} CH_3-CH_2-CH_2-OH + Br^{\ominus}$

(2) $CH_3-CH_2-CH_2-Cl \xrightarrow{\overset{\ominus}{O}H} CH_3-CH_2-CH_2-OH + Cl^{\ominus}$

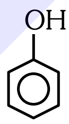
(3) $CH_3-CH_2-CH_2-F \xrightarrow{\overset{\ominus}{O}H} CH_3-CH_2-CH_2-OH + F^{\ominus}$

(4) $CH_3-\underset{F}{CH}-CH_3 \xrightarrow{\overset{\ominus}{O}H} CH_3-\underset{OH}{CH}-CH_3 + F^{\ominus}$

HD0070

16. Rate of S_N2 reaction will be maximum in which of the following solvent -

(1) H_2O (2) CH_3OH

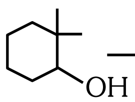
(3)  (4) DMSO

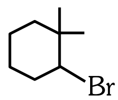
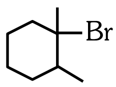
HD0071

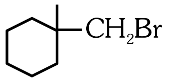
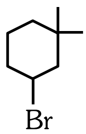
17. Best method to convert alcohol into alkyl chloride is -

(1) $ROH + SOCl_2 \longrightarrow R-Cl + SO_2 + HCl$
(2) $R-OH + PCl_3 \longrightarrow R-Cl$
(3) $R-OH + PCl_5 \longrightarrow R-Cl$
(4) $R-OH + HCl \longrightarrow R-Cl + H_2O$

HD0072

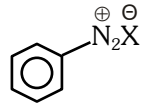
18.  $\xrightarrow{HBr}$ Major product ?

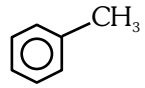
(1)  (2) 

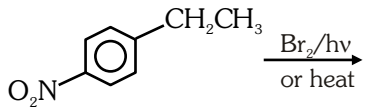
(3)  (4) 

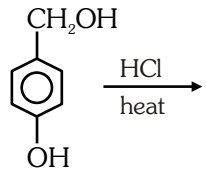
HD0073

19. Identify incorrect match in the following -

(1)  ESR

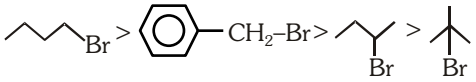
(2)  ESR

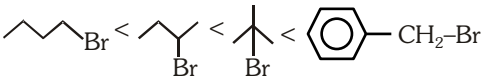
(3)  FRSR

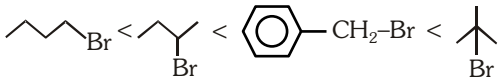
(4)  NSR

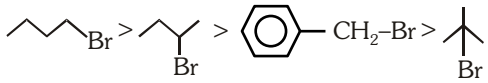
HD0074

20. The correct reactivity order for S_N1 reactions is-

(1) 

(2) 

(3) 

(4) 

HD0075

21. Which of the following is most reactive for S_N2 reactions.

(1) $(C_6H_5)_2C(CH_3)Br$ (2) $C_6H_5CH(CH_3)Br$

(3) $(C_6H_5)_3CBr$ (4) $C_6H_5CH_2Br$

HD0076

EXERCISE-III (Analytical Questions) ANSWER KEY

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