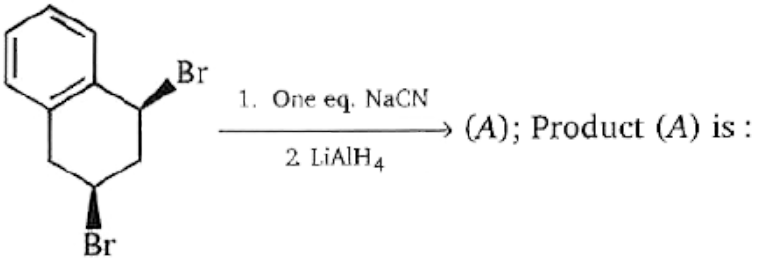
CHEMISTRY

BOOKS - MS CHOUHAN

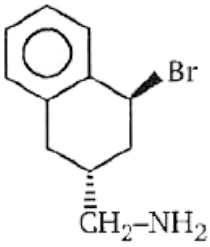
5C ALKYL HALIDES

Level 1

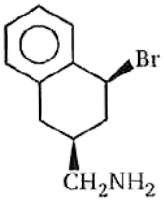
1. Complete the following reaction



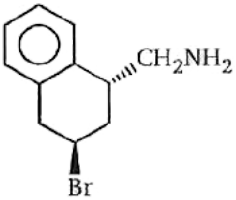
A.



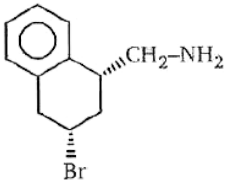
B.



C.



D.



Answer: C

Watch Video Solution

2. In the reactions given below,

$$R - Cl \xrightarrow{(i)\,KCN\,,\,(ii)\,LiAlH_4} \text{Product A}$$

$$R - Cl \xrightarrow{(i)\,AgCN\,,\,(ii)\,LiAlH_4} \text{Product B}$$

the compounds A and B are :

A. chain isomers

B. position isomers

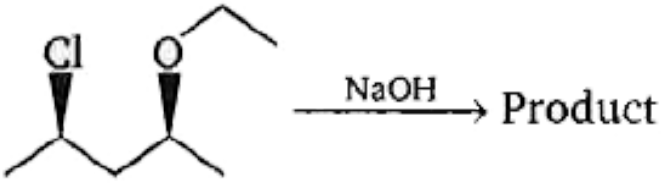
C. functional isomers

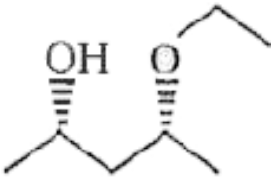
D. metamers

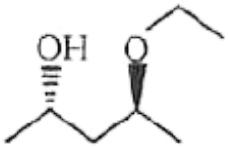
Answer: C

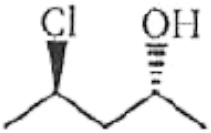
Watch Video Solution

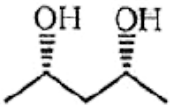
3. Which is the major product expected from the following S_{N^2} reaction?



A. 

B. 

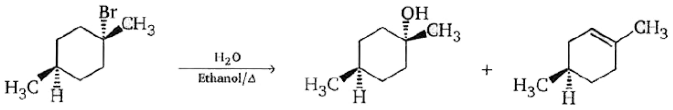
C. 

D. 

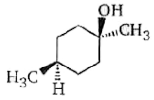
Answer: B

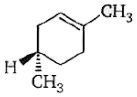
Watch Video Solution

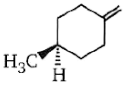
4. Consider the following E_1 / S_{N^1} reaction

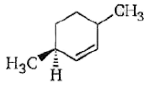


The missing product(s) is(are) :

(1)


(2)


(3)


(4)


A. 1,2 and 3

B. 3 and 4

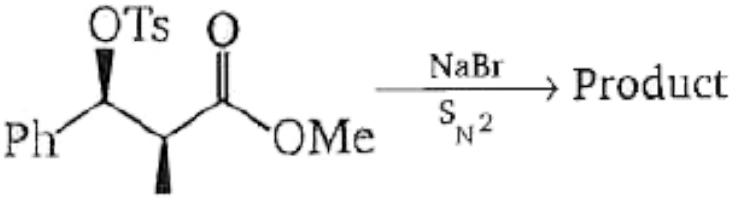
C. 2 and 3

D. 1,2,3 and 4

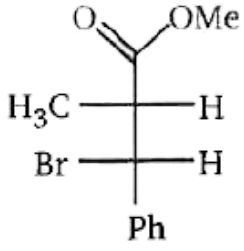
Answer: A

Watch Video Solution

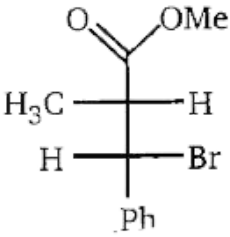
5. What is the product ofthe following S_{N^2} reaction?



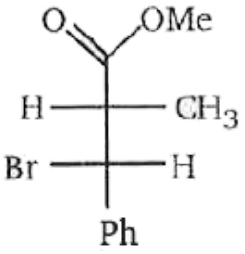
A.

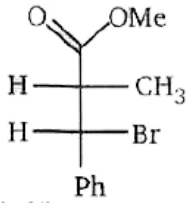


B.



C.



D. 

Answer: A

Watch Video Solution

6. Select the reagent that will yield the greater amount of substitution on reaction with $CH_3 - CH_2$ - Br:

A. CH_3CH_2OK in dimethyl sulfoxide (DMSO)

B. $(CH_3)_2COK$ in dimethyl sulfoxide (DMSO)

C. Both (a) and (b) will give comparable amounts ofsubstitution

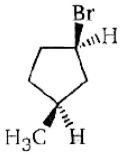
D. Neither (a) nor (b) will give any amount ofsubstitution

Answer: A

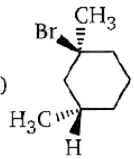
Watch Video Solution

7. Under the specified conditions, substrate X undergoes substitution and elimination reactions to give products A-D. A and Bare stereoisomers, but not enantiomers. C and D are enantiomers. A is notanisomer of C. Which of the following could be the starting material X?

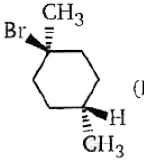
$$X \xrightarrow[\Delta]{H_2O} A + B + C + D$$



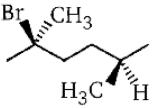
(II)



(III)



(IV)



A. (I)

B. (II)

C. (III)

D. (IV)

Answer: C

Watch Video Solution

8. $CH_3-\underset{\underset{Br}{|}}{\overset{\overset{CH_3}{|}}{C}}-CH_3$ (a) $\qquad CH_3-\underset{\underset{Br}{|}}{C}H-CH_3,$ (b) $\qquad CH_3-\underset{(c)}{C}H-Br$

Compare the of E_2 reaction :

A. $c > b > a$

B. $a > b > c$

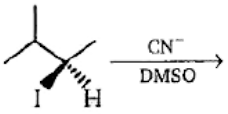
C. $b > a > c$

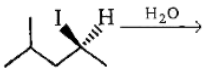
D. $c > a > b$

Answer: B

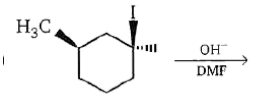
Watch Video Solution

9. Which reaction results in the formation ofa pair of enantiomers ?

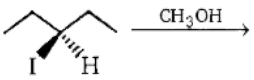
A. 

B. 

C.



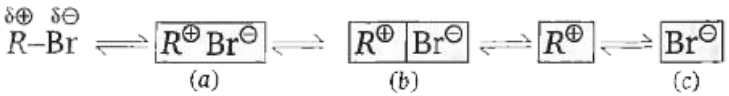
D.



Answer: B

Watch Video Solution

10. Rate limiting S_{N1} follows the sequence



True statement about sequence on the basis of assumption that R contains 3 different groups is :

A. more stable carbocation, greater is in the proportion of racemization

B. the more nucleophilic the solvent greater in the proportion of inversion

C. In above sequence (b) represent separately solvated, pair ofions

D. All of these

Answer: D

Watch Video Solution

11. Compare the two methods shown for the preparation of carboxylic acids:

$$\textbf{Method 1 :}\quad RBr \xrightarrow[\text{diethyl ether}]{Mg} RMgBr \xrightarrow[2.\,H_3O^+]{1.\,CO_2} RCO_2H$$

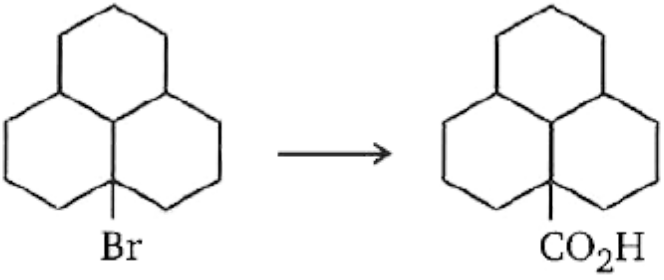
$$\textbf{Method 2 :}\quad RBr \xrightarrow{NaCN} RCN \xrightarrow[heat]{H_2O,\,HCl} RCO_2H$$

Mehod 1 : $RBr \xrightarrow[\text{diethyl ether}]{Mg} RMgBr \xrightarrow[2.\,H_3O^+]{1.\,CO_2} RCO_2H$

Method 2 : $RBr \xrightarrow{NaCN} RCN \xrightarrow[heat]{H_2O,\,HCl} RCO_2H$

Which one of the following statements correctly describes this

conversion ?



A. Both method 1 and method 2 are appropriate for carrying out this conversion

B. Neither method 1 nor method 2 is appropriate for carrying out this conversion

C. Method 1 will workwell, but method 2 is not appropriate

D. Method 2 will workwell, but method 1 is not appropriate

Answer: C

Watch Video Solution

12. Which of the following statements is true?

A. $CH_3CH_2S^-$ is both a stronger base and more nucleophilic than $CH_3CH_2O^-$

B. $CH_3CH_2S^-$ is a stronger base but is less nucleophilic than $CH_3CH_2O^-$

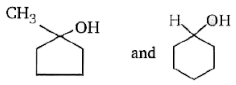
C. $CH_3CH_2S^-$ is a weaker base but is more nucleophilic than $CH_3CH_2O^-$

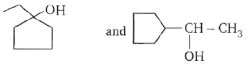
D. $CH_3CH_2S^-$ is both a weaker base and less nucleophilic than $CH_3CH_2O^-$

Answer: C

Watch Video Solution

13. In the given pair of alcohols, in which pair second alcohol is more reactive than first towards hydrogen bromide?

A. 

B. 

C.

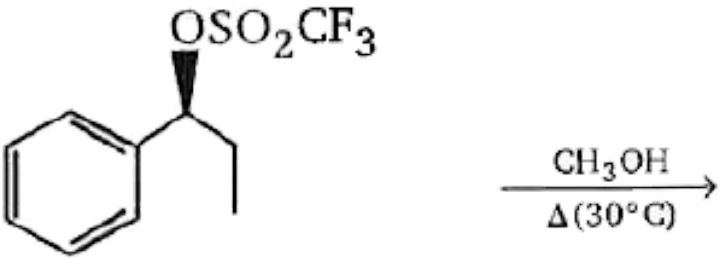
$$CH_3 - \underset{\underset{OH}{|}}{C}H - CH_2 - CH_3 \text{ and } CH_3 - CH_2\underset{\underset{CH_3}{|}}{C}H - CH_2 - OH$$

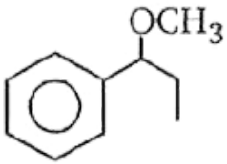
D. $CH_3 - \underset{\underset{OH}{|}}{C}H - CH_2 - CH_3$ and $(CH_3)_2\underset{\underset{OH}{|}}{C} - CH_2 - CH_3$

Answer: D

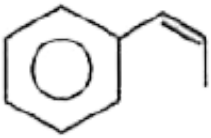
Watch Video Solution

14. Which product would be expected to predominate in the given reaction ?

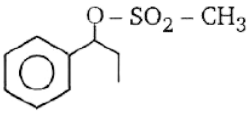


A. 

B.



C.

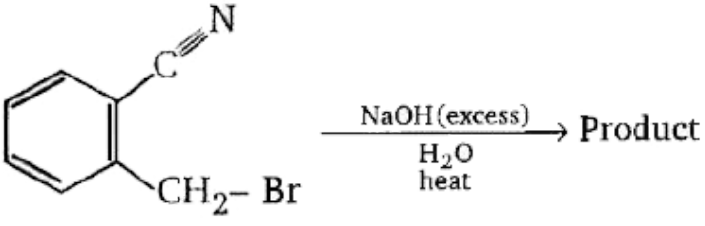


D. None of these

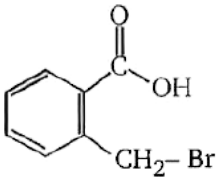
Answer: A

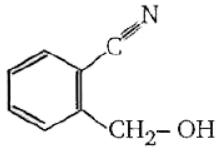
Watch Video Solution

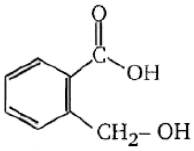
15. Which is the major product of the following reaction?

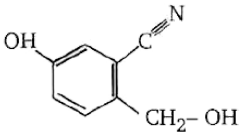


A.



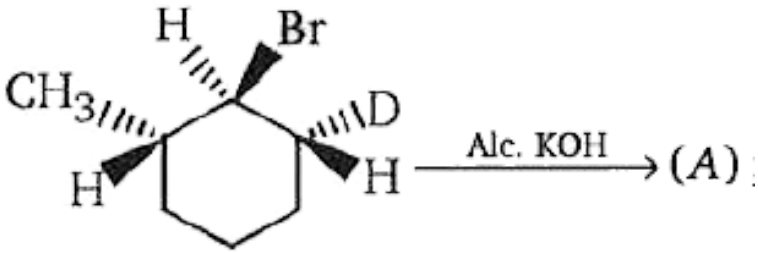
B. 

C. 

D. 

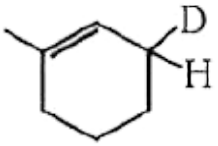
Answer: C

Watch Video Solution

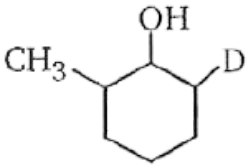
16. 

Major product ofthis reaction is :

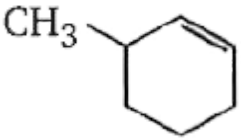
A.



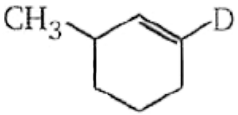
B.



C.



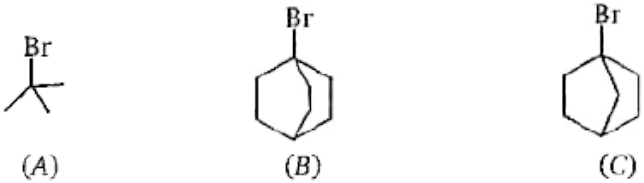
D.



Answer: C

Watch Video Solution

17. Rate of S_{N^2} reaction is :



(A) (B) (C)

A. $(B) > (A) > (C)$

B. $(C) > (A) > (B)$

C. $(A) > (B) > (C)$

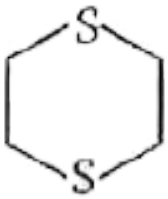
D. $(A) > (C) > (B)$

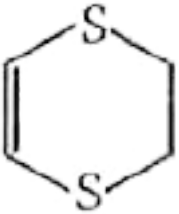
Answer: C

Watch Video Solution

18. 1-2 dichloro ethane + $NaSCH_2CH_2SNa \rightarrow C_4H_8S_2 + (P)$

Unknown product (P) ofthe above reaction is :

A. 

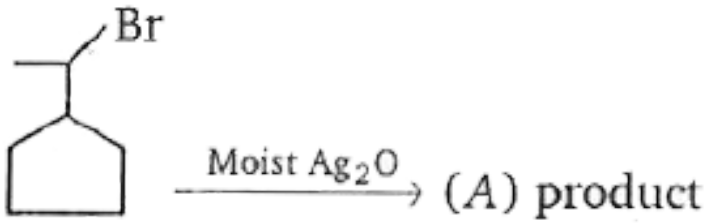
B. 

C. $H-S-\underset{H}{\underset{|}{C}}=\underset{H}{\underset{|}{C}}-CH=CH-S-H$

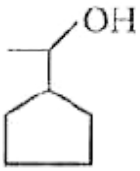
D. $H-\underset{H}{\underset{|}{C}}=\underset{H}{\underset{|}{C}}-CH=CH-S-H$

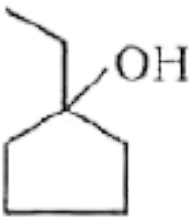
Answer: A

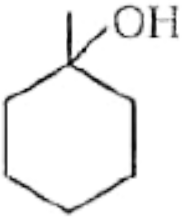
Watch Video Solution

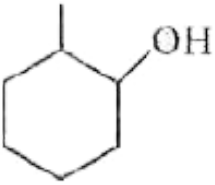
19. 

Major product (A) is :

A. 

B. 

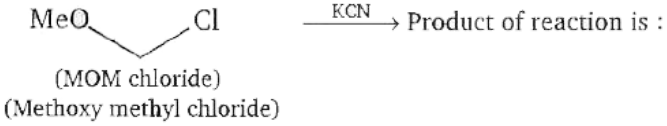
C. 

D. 

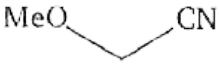
Answer: C

Watch Video Solution

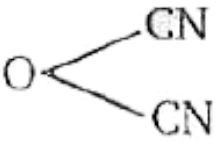
20. Complete the following reaction



A. 

B. 

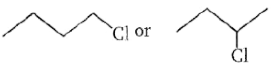
C. $Me - O - CH_2 - CH_2 - CN$

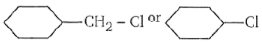
D. 

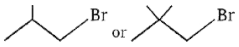
Answer: B

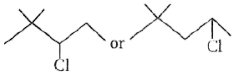
Watch Video Solution

21. In the given pair of compound, in which pair the second compoundis more reactive than first toward S_{N^2} reaction

A. 

B. 

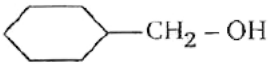
C. 

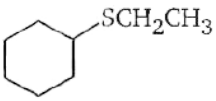
D. 

Answer: D

Watch Video Solution

22. Which compound might be synthesized by the S_{N^2} displacement of an alkyl-halide ?

A. 

B. 

C. $Me_3C - OCH_3$

D. All of these

Answer: D

Watch Video Solution

23. Identify C in the following series $C_3H_7I \xrightarrow[alc.]{KOH} A \xrightarrow[\Delta]{Nas} B \xrightarrow[alc.]{KCN} C$

A. $(CH_3)_2CH - CN$

B. $CH_2 = CH - CH_2CN$

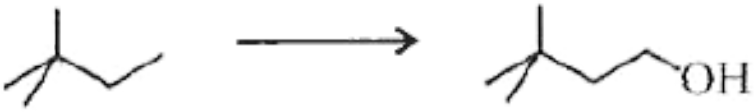
C. $Br - CH = CH - CN$

D. $CH_2 = CH - \underset{\underset{Br}{|}}{CH}CN$

Answer: B

Watch Video Solution

24. What sequence of reagents is required to accomplish the following transformation ?



A. (1) NBS,ROOR (2)

$CH_3CH_2O^-$ (3) $2HBr$ (4) NH_2^- (5) disiamyl borane (6) H_2O_2, OH^-

B.

(1) $Cl_2 hv$ (2) OH^-, heat, (3) $2HCl$ (4) OH^-, heat (5) $HgSO_4$, H_2SO_4

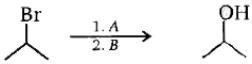
C. (1) NBS, $ROOR$, OH^- $^D MSO$

D. (1) Br_2, hv (2) t-butoxide (3) BH_3, THF (4) H_2O_2, OH^-

Answer: D

Watch Video Solution

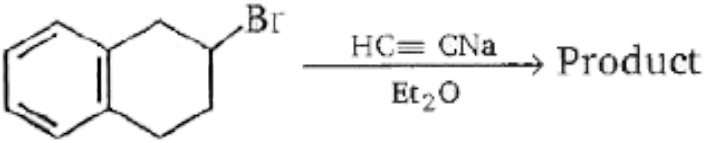
25. Which of the reagents shown below would accomplish the following transformations?

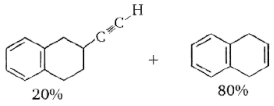


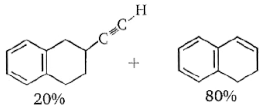
A	B
(a) H_3O^+	BH_3 – THF; H_2O_2/NaOH
(b) NaOH	BH_3 – THF; H_2O_2/NaOH
(c) HBr in ether	$Hg(OAc)_2/H_2O$; $NaBH_4$
(d) $NaNH_2$	$Hg(OAc)_2/H_2O$; $NaBH_4$

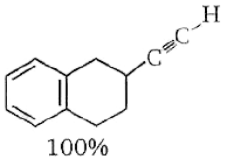
Watch Video Solution

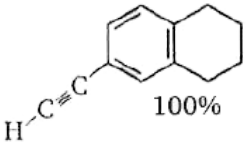
26. What are the products obtained from the following reaction?



A. 

B. 

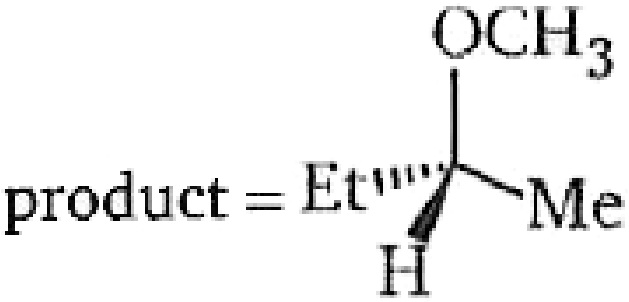
C. 

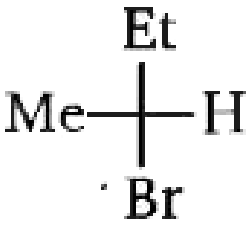
D. 

Answer: B

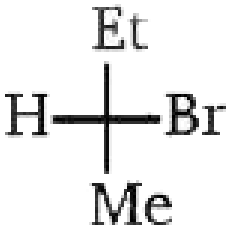
Watch Video Solution

27. The back-side attack on 2-bromobutane by methoxide $\left(CH_3O^-\right)$ gives the product shown below. Which Fischer projection represents 2-bromobutane used as the reactant in this reaction ?

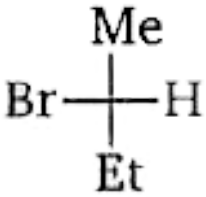




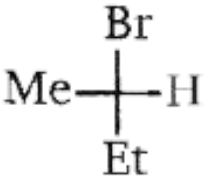
A.



B.



C.



D.

Answer: D

Watch Video Solution

28. Consider the following statements:

(1) Bridgehead halides are inert towards both S_{N^1} and S_{N^2} reactions (till oneof the ringsize is eight member ring)

(2) The first step in both S_{N^2} and E_1 reactions is the same

(3) S_{N^2} reactions proceed with total retention of configuration

(4) E_2 eliminations are by the use of a solvent of low polarity and high concentration of a strong base

Which of the above statements are correct?

A. 1,2 and 4

B. 1 and 3

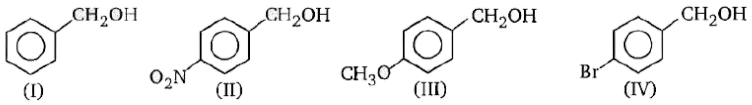
C. 2,3 and 4

D. 1,2,3 and 4

Answer: A

Watch Video Solution

29. Consider the following akohols



The order of decreasing reactivities of these alcohols towards substitution with HBr is :

A. $III > I > IV > II$

B. $III > I > II > IV$

C. $I > III > IV > II$

D. $I > III > II > IV$

Answer: A

Watch Video Solution

30. In solvolysis of 1, 2-dimethyl propyl p-toluene sulfonate in acetic acid at 75° C, (alkene + substitution products) will be formed by mechanism?

A. 2

B. 3

C. 4

D. 5

Answer: D

Watch Video Solution

31. Benzotrichloride reacts with milk oflime to form :

A. Benzal

B. Benzoic acid

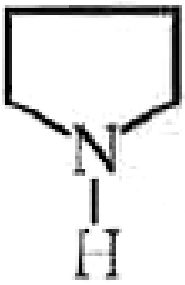
C. Benzyl alcohol

D. Phenol

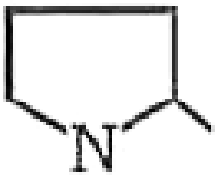
Answer: B

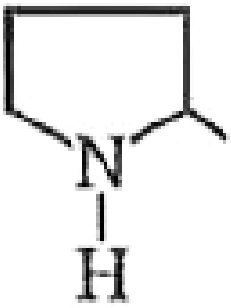
Watch Video Solution

32. $Br - CH_2 - (CH_2)_2 - CH_2 - Br + CH_3NH_2 \rightarrow$ Product of the reaction is :

A. 

B. 

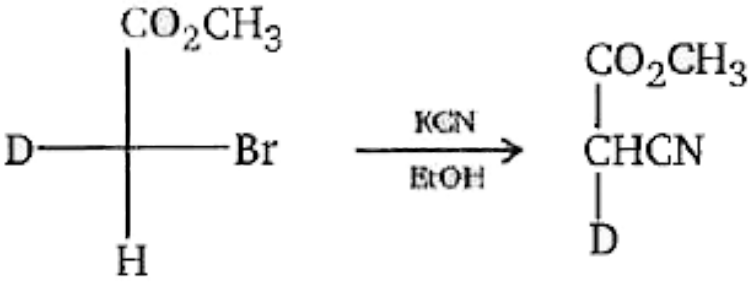
C. 

D. 

Answer: B

Watch Video Solution

33. The configurations of the reactant and the product in the following reaction, respectively, are



A. R,R

B. R,S

C. S,R

D. S,S

Answer: D

Watch Video Solution

34. 1-4-dichlorohexane (1 mole) + NaI (1 mole) $\xrightarrow{\text{Acetone}}$ Product of the reaction is :

A. $Cl - CH_2 - CH_2 - \underset{\underset{I}{|}}{CH} - CH_2 - CH_3$

B. $I - CH_2 - CH_2 - \underset{\underset{Cl}{|}}{CH} - CH_2 - CH_3$

C. $H_2C = CH - \underset{\underset{Cl}{|}}{CH} - CH_2 - CH_3$

D. $I - CH_2 - CH_2 - CH_2\underset{\underset{Cl}{|}}{CH} - CH_2 - CH_3$

Answer: D

Watch Video Solution

35. Alkyl halides can be obtained by all methods except:

A. $CH_3CH_2OH + HCl / ZnCl_2 \rightarrow$

B. $CH_3 - CH_2 - CH_3 - CH_2 \xrightarrow{Cl_2 / UV light}$

C. $C_2H_2OH + NaCl \rightarrow$

D. $CH_3COOAg + Br_2/CCl_4 \rightarrow$

Answer: C

Watch Video Solution

36. In order to prepare l-chloropropane, which ofthe following reactants can be employed ?

A. Propene and HCI in the presence ofperoxide

B. Propene and Cl_2 followed by treatment with aq. KOH

C. Propanol-l and $SOCl_2$ /pyridine

D. Any of the above can be used

Answer: C

Watch Video Solution

37. Which alkyl halide has maximum density ?

A. C_3H_7I

B. C_2H_5I

C. CH_3I

D. CH_3Br

Answer: A

Watch Video Solution

38. Which of the following molecules would have a carbon-halogen bond most susceptible to nucleophilic substitution ?

A. 2-fluorobutane

B. 2-chlorobutane

C. 2-bromobutane

D. 2-iodobutane

Answer: D

Watch Video Solution

39. When benzyl chloride is treated with ethanolic KCN, the major product formed is:

A. benzyl ethyl ether

B. benzyl alcohol

C. benzyl cyanide

D. benzyl isocyanide

Answer: C

Watch Video Solution

40. Which ofthe following is most reactive towards nucleophilic substitution reaction ?

A. $CH_2 = CH - Cl$

B. C_6H_5Cl

C. $CH_3CH = CHCl$

D. $ClCH_2 - CH = CH_2$

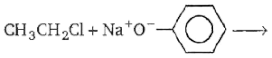
Answer: D

Watch Video Solution

41. Which of the following reaction will not give ether as a major product?

A. $CH_3CH_2Cl + Ag_2(dry) \rightarrow$

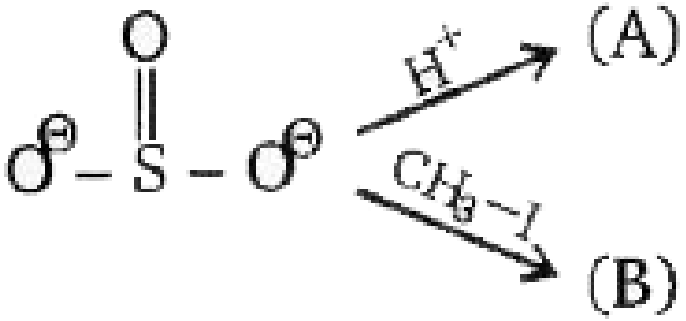
B. $(CH_3)_3CCl + CH_3CH_2O^{-N}a^+ \rightarrow$

C. 

D. $CH_3Cl + Na^+O^- - \underset{\underset{CH_3}{|}}{\overset{CH_3}{|}}{C} - CH_3 \rightarrow$

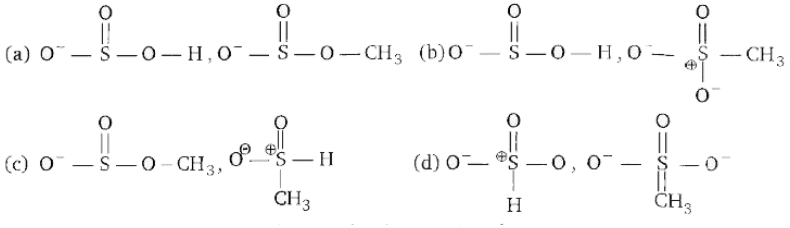
Answer: B

View Text Solution



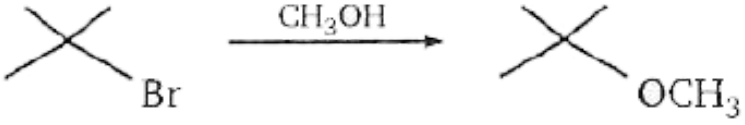
42.

Product (A) and (B) in above reaction is :



Watch Video Solution

43. Which of the following would be true for the reaction shown?



A. The rate ofthe reaction depends only on the alkyl bromide concentration.

B. The rate ofthe reaction depends only on the methanol concentration

C. The rate of the reaction depends on both the alkyl halide concentration and the methanol concentration.

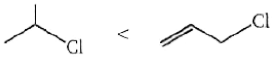
D. The rate ofthe reaction depends on the concentration ofneither reactant.

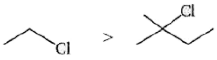
Answer: A

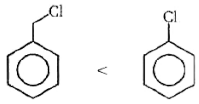
Watch Video Solution

44. The correct order ofrate of S_{N^1} is : is :

A. 

B. 

C. 

D. 

Answer: B

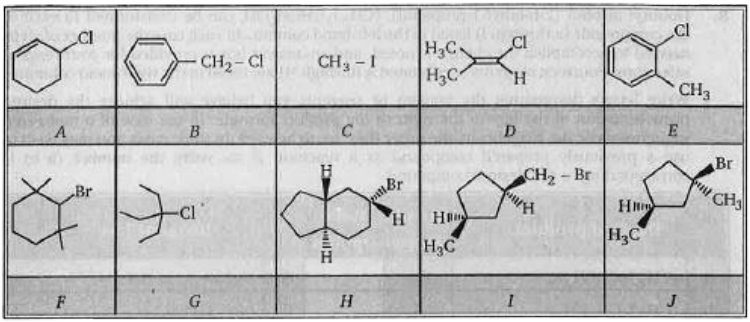
Watch Video Solution

Level 2

1. The following organic halide derivatives (A to J) are reacted in ethanol solution with each of the nucleophiles : acetate, methylthiolate, cyanide and hydroxide anions. Six possible results from these combinations of reactants are designated (1) through (6) below:

Write the number corresponding to your best estimate of the outcome

ofeach reaction in the appropriate answer box below.



Possible Outcome :

(1) No reaction
(2) Substitution
(3) Elimination
(4) Substitution and elimination
(5) No reaction or slow substitution
(6) No reaction or slow elimination

Compound		A	B	C	D	E	F	G	H	I	J
(i)	CH_3CO_2Na										
(ii)	CH_3SNa										
(iii)	NaCN										
(iv)	NaOH										

View Text Solution

2. In each of the following sections three organic halogen compounds are listed. In the box given enter a number (1 to 3) indicating the order

ofreactivity ofthe designated (1 is most reactive and 3 is least).

(a) S_{N^2} substitution by $NaOCOCH_3$ in methanol:
1. $CH_3CH_2CH_2Br$ ☐ 2. $(CH_3)_2CHBr$ ☐ 3. $CH_2 = CHCH_2Br$ ☐

(b) S_{N^2} substitution by NaI in acetone:
1. C_6H_5Cl ☐ 2. $C_6H_5CH_2Cl$ ☐ 3. $C_6H_5CHClCH_3$ ☐

(c) S_{N^2} substitution by NaCN in methanol:
1. CH_3CH_2Cl ☐ 2. CH_3CH_2F ☐ 3. CH_3CH_2I ☐

(d) S_{N^2} substitution by $NaSCH_3$ in methanol:
1. $(CH_3)_2CHCH_2CH_2Br$ ☐ 2. $CH_3CH_2CHBrCH_2CH_3$ ☐ 3. $(CH_3)_3CCH_2Br$ ☐

Watch Video Solution

3. Isobutyl alcohol (2-methyl-1-propanol) $(CH_3)_2CHCH_2OH$, can be transformed to each of the compounds (a through 1) listed in the left-hand column. In each case the number of steps needed to accomplish the change is noted, and an answer box is provided for your reagent Write letters designating the reagent or reagents you believe will achieve the desired transformation in the box to the right of the product formula. In the case of a multi-step sequence write the reagents in the order they are to be used. In some cases you maywish to use a previously prepared compound as a reactant. If so, write the number (a to 1) corresponding to

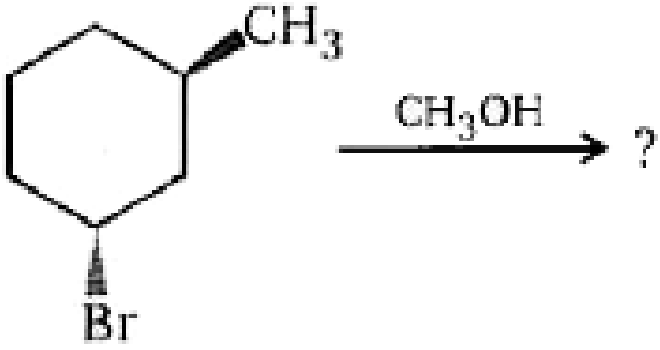
the desired compound.

	Desired product	No. of Steps	Write Options		Reagent List
a.	$(CH_3)_2CHCH_2Br$	one		A.	$Hg(OAc)_2$ in H_2O
b.	$(CH_3)_2C=CH_2$	one		B.	PBr_3 & heat
c.	$(CH_3)_2CHCH=O$	one		C.	$NaBH_4$ in alcohol
d.	$(CH_3)_2CHCO_2H$	one		D.	$LiAlH_4$ in THF (aqueous workup)
e.	$(CH_3)_3CBr$	two		E.	NaCN in alcohol
f.	$(CH_3)_2CHCH_2C\equiv N$	two		F.	PCC in CH_2Cl_2
g.	$(CH_3)_2CHCH_2OCOCH_3$	one		G.	Jones' reagent (CrO_3 in H_3O^+)
h.	$(CH_3)_2CHCO_2C_2H_5$	two		H.	HBr in CH_2Cl_2
i.	$(CH_3)_2CHCH_2OCH_2(CH_3)$	two		I.	H_3PO_4 and heat
j.	$(CH_3)_3COH$	three		J.	$(CH_3CO)_2O$ + pyridine
k.	$(CH_3)_2CHCH_2NH_2$	three		K.	NaN_3 in aqueous alcohol
l.	$(CH_3)_2CHCH_2CH_2NH_2$	two		L.	$C_6H_5CO_3H$ in CH_2Cl_2 (peracid)
				M.	NaH in ether and heat
				N.	C_2H_5OH + acid catalyst & heat

Watch Video Solution

Level 2 Subjective Problems

1.



X = Total number of substitution and elimination product(s). Find the value of X.

Watch Video Solution