CHEMISTRY

BOOKS - CENGAGE CHEMISTRY (HINGLISH)

ORGANIC REACTION MECHANISM

Illustration

1. Explain the effect of SN^2 rates for the following reactions :

(a) Increasing the polarity of solvent.

(b) Show the $T.\ S$ with all partial charges for each reaction type.

(I) $Me_2\overset{\oplus}{S} - Me + NH_3 \rightarrow Me\overset{\oplus}{N}H_3 + Me_2S$

(II) $MeI + NH_3 \rightarrow Me\overset{\oplus}{N}H_3 + I^{\ominus}$

(III) $MeI + \overset{\ominus}{O}H \rightarrow MeOH + I^{\ominus}$

(IV) $Me_2S^{\oplus} - Me + \overset{\ominus}{O}H \rightarrow MeOH + Me_2S.$

Watch Video Solution

Watch Video Solution

2. Explain the order of the following nucleophiles in weakly polar aprotic solvents, e.g., acetone.

(a) $LiI > LiBr > LiCI > \ > LiF$

(b) $CsF > RbF > KF > NaF > LiF$

(c) $Bu_4N^{\oplus}CI^{\ominus} > Bu_4N^{\oplus}Br^{\ominus} > Bu_4N^{\oplus}I^{\ominus}$.

Watch Video Solution

3. Of the following pairs, which one is the stronger base and stronger nucleophile ?

(a) (I) $MeO^{\ominus}$, (II) $MeOH$

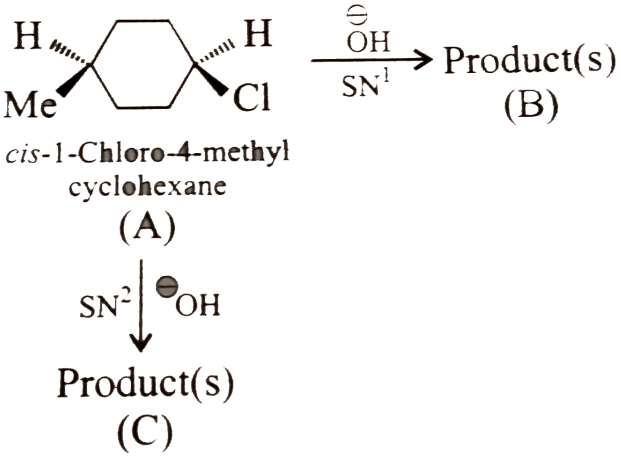
(b) (III) $\overset{\ominus}{O}H$, (IV) $\overset{\ominus}{C}N$

(c) (V) H_2O, (VI) $\overset{\ominus}{O}H$

(d) (VII) $\overset{\ominus}{N}H_2$, (VIII) NH_3.

Watch Video Solution

4. (a) Give the products of the following reactions :



b. 

(c) The reaction of C_2H_5OH with $NaBr$ in the presence of H_2SO_4 is slow, but when trimethy1 sily1 chloride (Me_3SiC1) is added to it, reaction proceeds very fast. Why ?

Watch Video Solution

5. Explain the reaction :

(a) $ROH + NaBr \rightarrow$

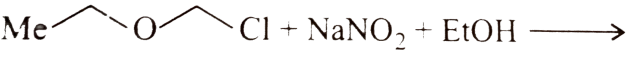
(b) $ROH + HBr \rightarrow$

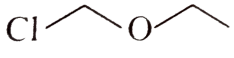
(c)

a. $ROH + NaBr \longrightarrow$

b. $ROH + HBr \longrightarrow$

c. 

d. 

e. **Account for the rapid rate of ethanolysis of**  **(I), although it is a 1° halide.**

Watch Video Solution

6. Give the organic products of the following reactions :

(a) $nPrBr + \overset{:O:}{\underset{\cdot\cdot}{N}} - \underset{\cdot\cdot}{\overset{\cdot\cdot}{O}}:^{\Theta}$

(b) $i - Pr - Br + \left|:\overset{\cdot\cdot}{\underset{\cdot\cdot}{S}}C \equiv N:\right|^{\Theta}$ (Isocyanate)

(c) $Et - Br + \left|:\overset{\cdot\cdot}{\underset{\cdot\cdot}{S}} - SO_3\right|^{2\Theta}$ (Thiosulfate)

(d) $C1(CH_2)_3I + CN^{\Theta}$ (One mole each)

(e) $H_2N(CH_2)_4Br \xrightarrow{-H^{\oplus}}$.

(f) $Me-O-\underset{\underset{(\text{Dimethyl sulphate})}{}}{\overset{\overset{O}{\|}}{\underset{\underset{O}{\|}}{S}}}-O-Me+EtS^{\ominus}\rightarrow$

(g) $MeONO_2(\text{Methy1 nitrite})+N_3^{\ominus}(\text{From}NaN_3)\rightarrow$

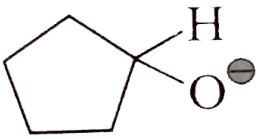
(h) $MeCN+HS^{\ominus}\rightarrow$

(i) $Me-O-\underset{\underset{\text{Methyl fluorosulfonate}}{}}{\overset{\overset{O}{\|}}{\underset{\underset{}{\|}}{S}}}-F+I^{\ominus}\rightarrow .$

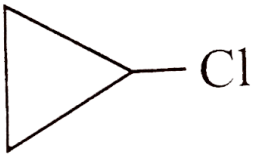
Watch Video Solution

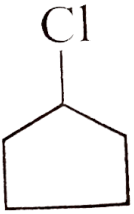
7. (I) Give the decreasing order of SN^2 reacivity of the following alkoxide nucleophile.

$Me_3CO^{\ominus}, MeCH_2O^{\ominus}, Me_2CHO^{\ominus}$

and 

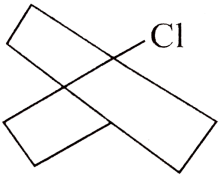
II. Compare the rates of SN^1

a. 

and 

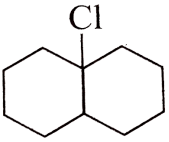
and

(b)



1-Chloro bicyclo [2.2.2.] octane
(A)

and



9-Chloro decalin
(B)

View Text Solution

8. Optically pure $(+)-2$ -chlorooctane, $[\alpha] = +40^\circ$, reacts with aq. $NaOH$ in acetone to give optically pure $(-)-2$ -octanol, $[\alpha] = -12.0^\circ$. With partically racemised chloro compound whose $[\alpha] = +30^\circ$, the $[\alpha]$ of alcohal product is -6.0°. Calculate :

(a) The percentage optical purity of partially racemised chloro compound and alcohol.

(b) The percentage of inversion and racemisation.

(c) The percentage of front-side and back-side attacks.

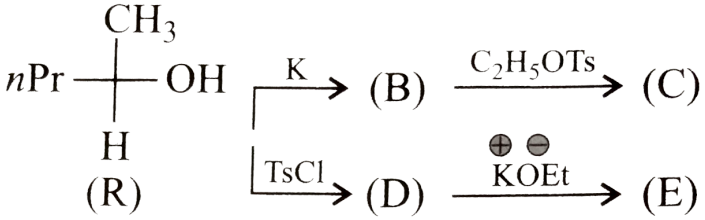
(d) What interference can be drawn from the data in part (a) of the above example, about the mode of 2° alky1 halide.

(e) Give the rate expression.

In terms if the expression, decrease the experimental changes for encourage (i) SN^1, (ii) SN^2,

Watch Video Solution

9. Explain the sterochemistry of the intermediates and products in the following reaction and give their R and S configurations.



Watch Video Solution

Watch Video Solution

10. Predict the effect of increasing the percentage of H_2O in acetone $-H_2O$ solvent mixture in :

(a) SN^1 solvolysis of Me_3C-Br

(b) SN^2 reaction of $K1$ and $EtC1$.

(c) Predict the relative yields of the product of Me_3CBr in $80\,\%\ EtOH$ and $20\,\%\ H_2O$.

Watch Video Solution

11. Account for the following observations :

(a) $t-BuF$ is solvolysed only in very acidic solution.

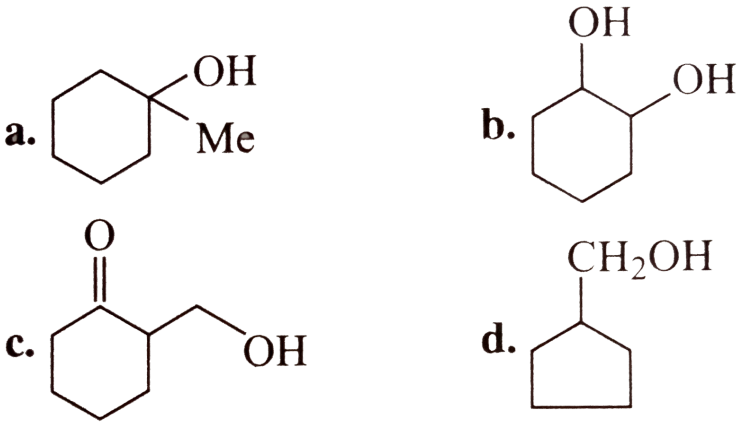
(b) $t-BuC1$ is solvolysed more slowly than 2-chloro-2,3,3,-trimethy1-butane (A).

(c) $t-BuC1$ is solvolysed much faster than 2-chloro-1,1,1-trifluoro-2-methy1 propane (B).

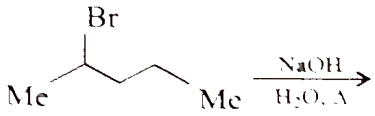
(d) $t - BuC1$ is solvolysed more slowly in $90\ \%\ D_2O - 10\ \%$ dioxane than in $90\ \%\ H_2O - 10\ \%$ dioxane solution.

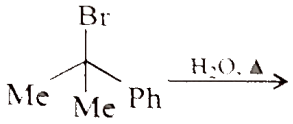
Watch Video Solution

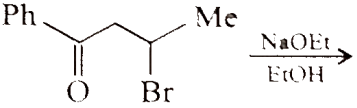
12. (I) Identify the products of dehydration of following alcohols.



(II) Predict the product and mechanism, $E1$, $E2$, or $E1cB$.

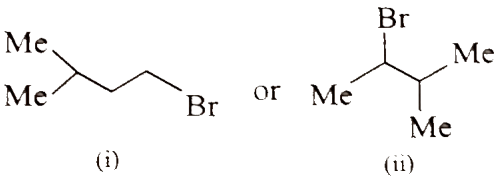
a. 

b. 

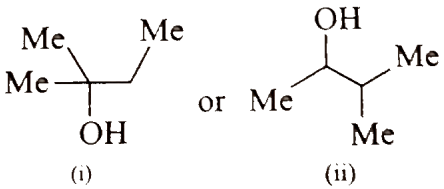
c. 

(III) Of the following pairs of structures, choose the componds that better fir the description.

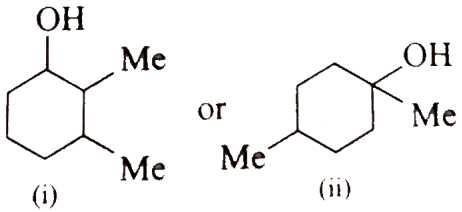
(a) Gives more Saytzeff product in an $E2$ reaction



b. Reacts more rapidly with cold aqueous HBr.

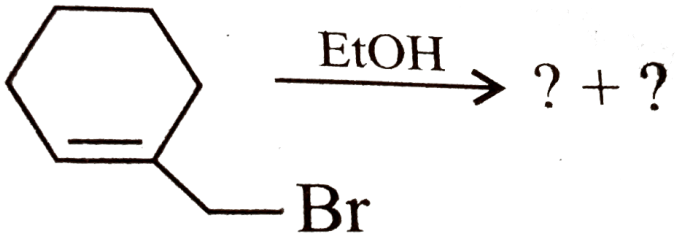


c. Gives a mix of two alkenes by E1 reaction.



Watch Video Solution

13. Give all the possible major and minor products $(SN^1$ and $E1)$ in the following. Explain.



(b) If t-pentyl shloride reacts with $25\,\%\ H_2O$ and $75\,\%\ C_2H_5OH$ in $NaOH$, what are the possible products formed ? Explain with mechanism.

Watch Video Solution

14. Give the product and find out which is faster ?

(a) (i) $CH_3CH_2I \xrightarrow{\ominus\ OH}$

(ii) $D_3C - CH_2I \xrightarrow{\ominus\ OH}$

(b) Give the product and find out which is faster out of SN^1 and $E1$ and why ?

(i) $(CH_3)_3CC1 \xrightarrow{\ominus\ OH}$

(ii) $(CD_3)_3C - C1 \xrightarrow{\ominus\ OH}$.

Watch Video Solution

15. (a) Give the products of the reaction of KOH with

(i) C_4H_9Br

(ii) $C_2H_5CHBrCH_3$

(iii) Me_3CBr

(b) Give the reactivity order.

(c) Give the factors that determine the major product.

Watch Video Solution

16. (a) Why does 3° RX rarely undergo $E1$ reaction ?

(b) How can $E1$ be promoted ?

(c) Give the products in the following reaction.

$$CH_3CHBrCH_3 \xrightarrow[\text{EtOH}]{\text{EtOH/NaOH}} \begin{matrix}(A)\\(B)\end{matrix}$$

(d) Give the products of $MeONa$ with

(i) cis and

(ii) trans-2-Bromomethy1 cyclohexane.

Watch Video Solution

17. (a) Compare the reactivity of $Me_3CO^{\ominus}K^{\oplus}$ and $EtNH_2$ in $E2$ reaction.

(b) Why is $Me_3CO^{\ominus}K^{\oplus}$ superior to $EtO^{\ominus}$ in $E2$ reaction ?

(c) Compare the effectiveness of $Me_3CO^{\ominus}K^{\oplus}$ in $DMSO$ and Me_3COH as solvents.

(d) $Me_2CC1CH_2CH_3 \xrightarrow{Me_3CO^{\ominus}K^{\cdot}}$ Major alkene.

Watch Video Solution

18. Complete the following and point out the mechanism as SN^2, SN^1, $E1$, $E2$, or none.

(a) $Me_2C = CHC1 + NaNNH_2$

(b) $CH_3CH_2Br + \ddot{P}me_3$

(c) $BrCH_2CH_2CH_2Br + I^{\ominus}$

(d) $BrCH_2(CH_2)_2CH_2Br + Mg$ (ether)

(e) $Me_3CBr + HCOOH + HCOO^{\ominus}$ (small amount)

(f) $Me_3CBr + HCOOH$

(g) $CH_3CH_2CH_2Br + LiA1D_4$.

Watch Video Solution

19. Give the symbol SN^1, SN^2, $E1$, and $E2$ (more than one symbol may be used).

(a) Rates are same.

(b) Electrophilic catalysis is possible.

(c) With a given substrate some pairs of these may be concurrent.

(d) Rearrangement of the R skeleton may occur.

(e) $R1$ reacts faster with $RC1$

(f) $R^{\oplus}$ are intermediates.

(g) With saturated $R's$, a Saytzeff product is always formed.

(h) Reactions are stereospecific.

(i) Reactions are concerted.

(j) Unhindered $1^{\circ} RX$ reacts with $NaOEt \mid EtOH$.

(k) $t-BuBr$ reacts with $CH_3COOH + CH_3COO^{\ominus} Na^{\oplus}$ (small).

(l) $t-BuBr$ reacts with $CN^{\ominus}$.

(m) $t-BuBr$ reacts in $EtOH$.

(n) $2^{\circ} RC1$ reacts with $NaOEt \mid EtOH$.

(o) $2^{\circ} RC1$ reacts with $HCOOH$ and has high dielectric constant.

(p) $2^{\circ} RC1$ reacts with $I^{\ominus}$ in acetone.

(q) MeX cannot react.

Watch Video Solution

20. (a) When cis-2,3-dibromopent-2-ene is hydrogenated with H_2 / Pt,

The product is :

(i) $Meso-2,3$ -Dibromopentane

(ii) $(+)2,3$ -Dibromopentane

(iii) $(-)2,3$ -Dibromopentane

(iv) $(\pm)2,3$ -Dibromopentane

(b) When trans-2,3-dibromopentane-2-ene is hydrogenated with H_2 / Pt. The product is :

(i) Meso-2,3 -Dibromopentane

(ii) $(+)2,3$ -Dibromopentane

(iii) $(-)2,3$ -Dibromopentane

(iv) $(\pm)2,3$ -Dibromopentane

(c) When $cis-2,3$ -dibromopent-2-ene is hydrogenated with Birch reduction. The product is :

(i) Meso-2,3-dibromopentane

(ii) $(+)2,3$ -Dibromopentane

(iii) $(-)2,3-$ Dibromopentane

(iv) $(\pm)2,3$ -Dibromopentane

(d) When trans-2,3-dibromopent-2-ene is hydrogenated with $Na + liq.\ NH_3$ + ethanol. The product is :

(i) Meso-2,3-dibromopentane

(ii) $(+)2,3$ -Dibromopentane

(iii) $(-)2,3$ -Dibromopentane

(iv) $(\pm)2,3$ -Dibromopentane

(e) When 2-butyne is reduced with Lindlar's catalyst. The product is :

(i) cis-2-Butene

(ii) trans-2-Butene

(iii) Both (i) and (ii)

(iv) None

(f) When 2-Butyne is reacted with $Na + liq.\ NH_3 + C_2H_5OH$. The product is :

(i) cis-2-Butene

(ii) trans-2-Butene

(iii) Both (i) and (ii)

(iv) None.

Watch Video Solution

Solved Example

1. (a) Explain how the sterochemistry of SN^1 and SN^2 differs.

(b) Explain the formation of $60\ \%$ inverted and $40\ \%$ racemic product

from a typical SN^1 reaction.

(c) Account for the following in terms of the rate of solvent in the above problem.

(i) The reaction is first order.

(ii) Under what conditions the rate expression is more than first order ?

(iii) What is the order and molecularity ?

Watch Video Solution

2. (a) Define dielectric constant.

(b) How does dielectric constant affect SN^1 rates ?

(c) Explain why solvolyses are much faster in $EtOH$ than in acetone even though both solvents have the same dielectric constants.

Watch Video Solution

3. (a) Show by enthalpy diagram the rate of solvolysis of $t-BuCl$ on increasing the polarity of solvent.

(b) Give the equation of methanolysis of $[Me_3CSMe_2]^{\oplus}Br^{\ominus}$.

(c) Does the effect of solvent prevail for solvolysis of $[Me_3CSMe_2]^{\oplus}$?

Watch Video Solution

4. Hydrolysis of 2-bromo-3-methyl butane (2°) yields only 2-methy-2-butanol (3°), explain.

Watch Video Solution

5. Write structure for the solvolysis of Et_3C-Cl with :

(a) $MeOH$

(b) $MeCOOH$

(c) $HCOOH.$

Watch Video Solution

6. Explain the relative rates of RX with $H_2\emptyset EtOH$ at $25^\circ C$ as given :

(i) $MeBr(2140)$

(ii) $MeCH_2Br(171)$

(iii) $Me_2CHBr(4.99)$

(iv) $Me_3CBr(1010)$

(b) Why is $EtOH$ added to water ?

Watch Video Solution

7. Predict the order of nucleophicity of $X^{\ominus}$ in the following reaction :

$$(C_5H_{11})_4N^{\oplus}X^{\ominus}\ (X^{\ominus} = Cl,\ Br,\ I) \xrightarrow{\Delta} (C_5H_{11})_3N + C_5H_{11}X$$

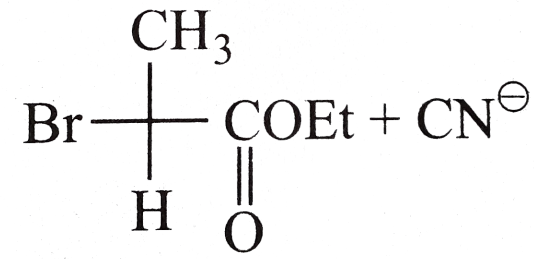
Watch Video Solution

8. Give the product of the following displacement reactions :

(a) $(R) - CH_3CHBrCH_2CH_3 + MeO^{\ominus}$

(b) $(S) - CH_3CHBrCH_2CH_3 + MeO^{\ominus}$

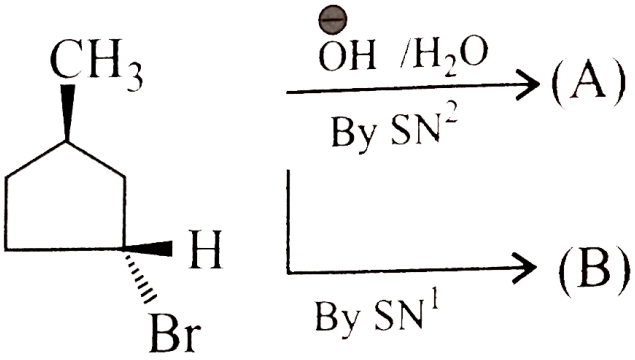
(c) rac, cis-Iodo ethyl cyclohexane $+ \overset{\ominus}{O}H$

d. $(S) -$ 

(d)

Watch Video Solution

9. Explain



trans-3-Bromo-
methyl cyclopentane

Watch Video Solution

10. When 3-chlorocyclopropene (A) is treated with $SbCl_5$, it gives a stable salt (B), $C_3H_3SbCl_6$, which is highly polar. Further, when (A) is treated with $AgBF_4$, it gives a white precipitate of $AgCl$ and a crystalline salt (C). Explain.

View Text Solution

11. Explain :

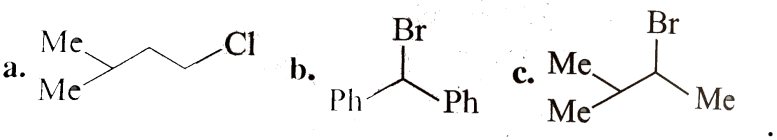
(a) An aq. Solution to troplylium bormide (C_7H_7Br) on treatment with $AgNO_3$ gives a pale yellow precipitate.

(b) Cycloheptatrienyl cation has a low π -electron energy than its open-chain counterparts.

(c) Cyclo-octatetraene reacts with 2 mol of potassium to yield a stable compound.

Watch Video Solution

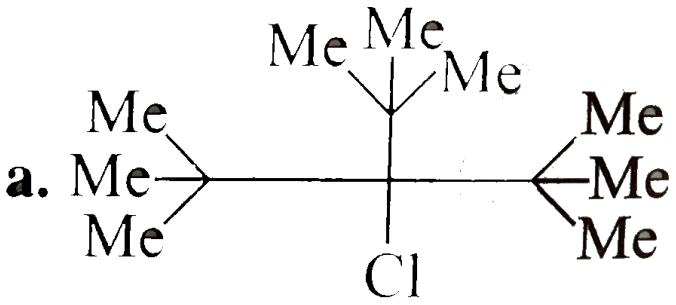
12. Give the order of reactivity towards aqueous $HCOOH$ of the following.



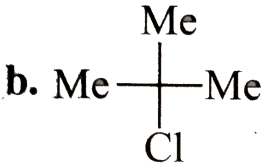
Watch Video Solution

13. Give the order of hydrolysis in SN^1 process for the following :

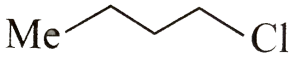
i. a.



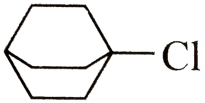
b.



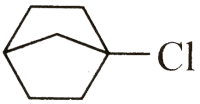
c.



ii. a.



b.



Watch Video Solution

14. Give the order of (a) nucleophilicity (b) basic character, and (c) fugacity of the following :

(i) $F^{\ominus}$

(ii) $Cl^{\ominus}$

(iii) $Br^{\ominus}$

(iv) $I^{\ominus}$.

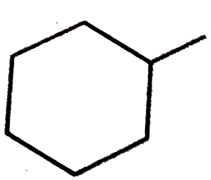
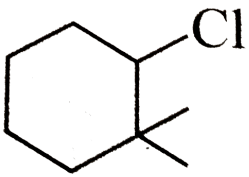
Watch Video Solution

15. Give the most reactive substrate in each of the following pair with $\overset{\ominus}{OH}$ ions under SN^2 conditions.

(a) C_2H_5I and C_2H_5Cl

(b) $p-Br-C_6H_4CH_3$ and $PhCH_2Br$

(c) CH_3Cl and CH_2Cl_2

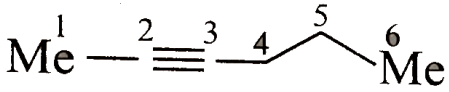
d.  **and** 

(d)

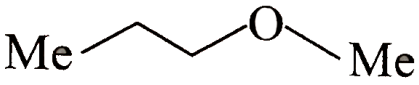
Watch Video Solution

16. Outline the synthesis of following compounds from suitable nucleophiles and an appropriate halide.

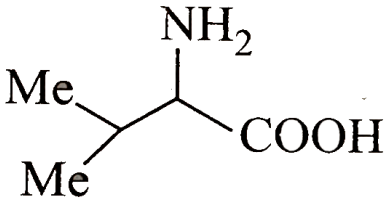
i.



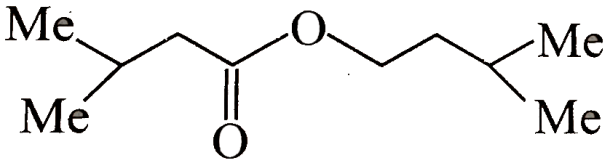
ii.



iii.

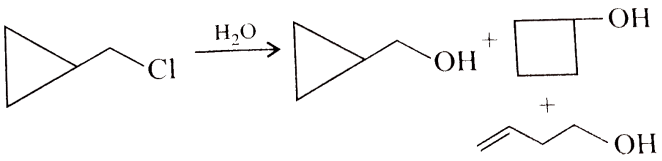


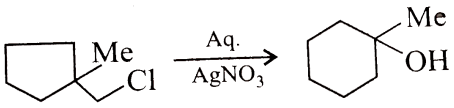
iv.

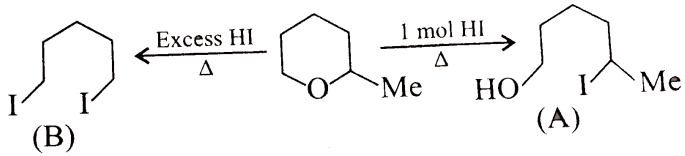


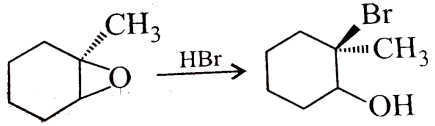
Watch Video Solution

17. Give a suitable mechanism for the following :

i. 

ii. 

iii. 

iv. 

Watch Video Solution

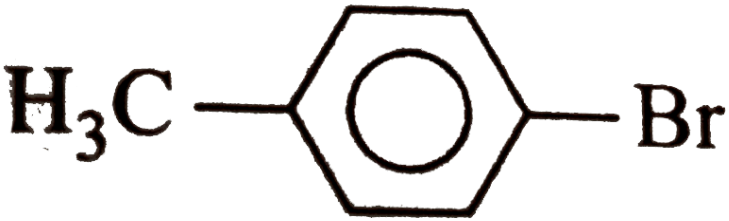
18. Predict the order of reactivity of the following halides with (a) NaI in acetone

(b) aq.alcoholic $AgNO_3$

(i) CH_3Br

(ii) C_2H_5Br

(iii) $PhCH_2Br$



(iv) .

Watch Video Solution

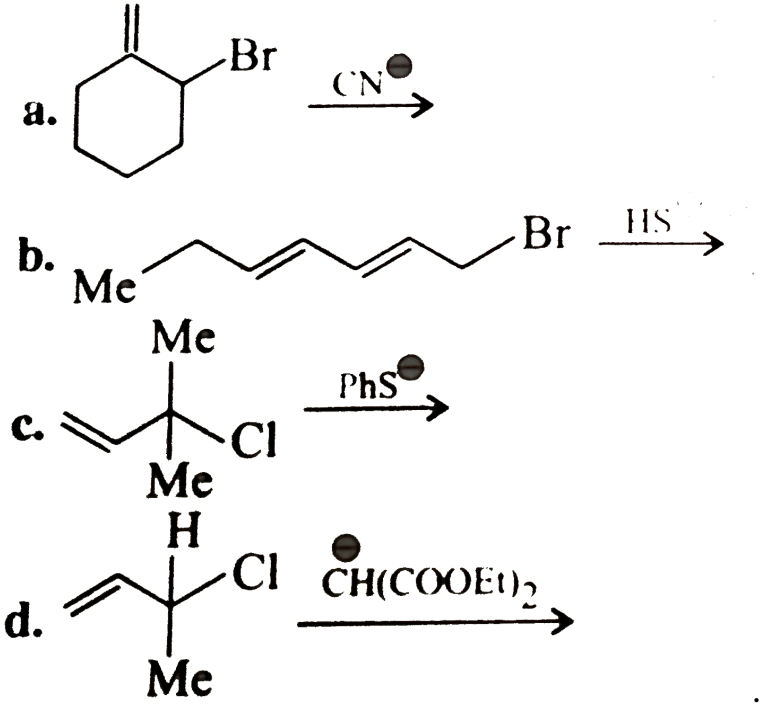
19. Explain :

(a)$ClCH_2OCH_3$ (chloromethyl methyl ether) undergoes SN^1 reaction.

(b) $(+)-4$ -Bromo-2-pentene forms a racemic mixture on treatment with NaI.

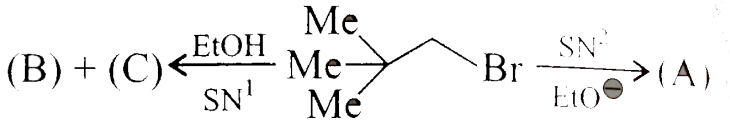
Watch Video Solution

20. Write the products of the following SN reactions.



Watch Video Solution

21. Complete the following reaction



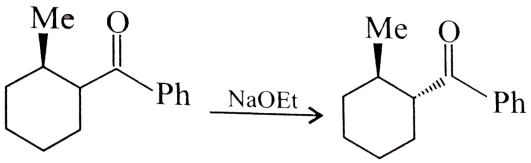
Watch Video Solution

22. Bromobenzene can be dehydrobrominated to benzyne by three possible routes. Explain. Which paths are desirable ?

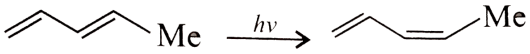
Watch Video Solution

23. Classify the following reactions as addition, elimination, substitution, condensation, rearrangement, geometric isomerisation, or oxidation/reduction.

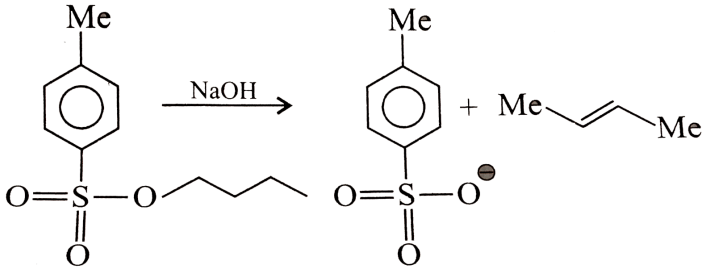
a.



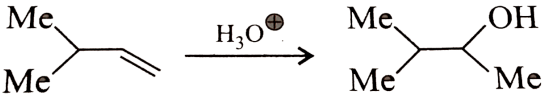
b.



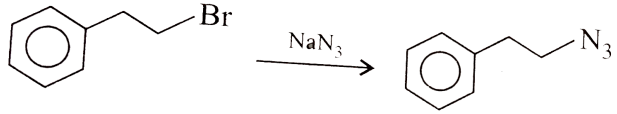
c.



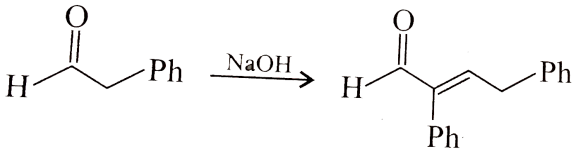
d.



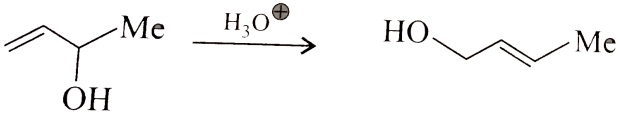
e.



f.

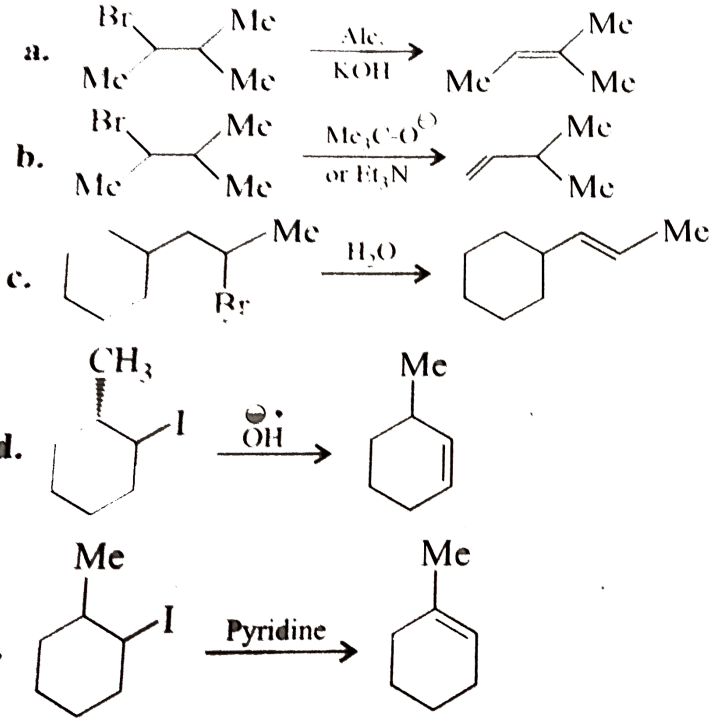


g.



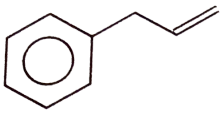
View Text Solution

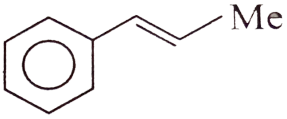
24. From the following elimination reactions, predict which one is Hofmann or Saytzeff (Zaitev) type.

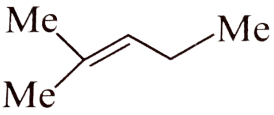


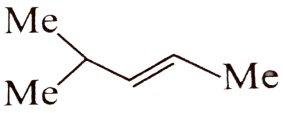
Watch Video Solution

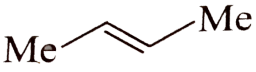
25. Which one is more reactive towards acidcatalysed hydration ? Predict the stereochemical alcohols formed form the compound.

a. i. 

ii. 

b. i. 

ii. 

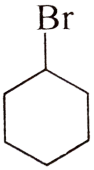
c. i. 

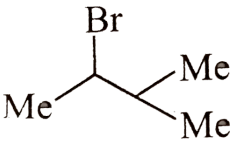
ii. 

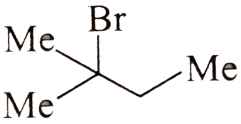
Watch Video Solution

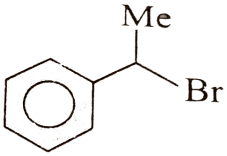
26. Which one hydrolyses at a faster rate by SN^1 mechanism ?

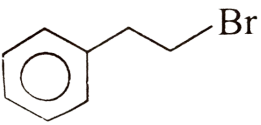
a. i. 

ii. 

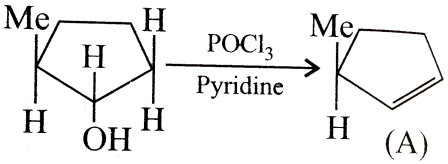
b. i. 

ii. 

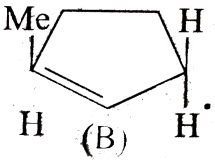
c. i. 

ii. 

Watch Video Solution



and not (B), as expected by Saytzeff (Zaitev)



27. Explain :

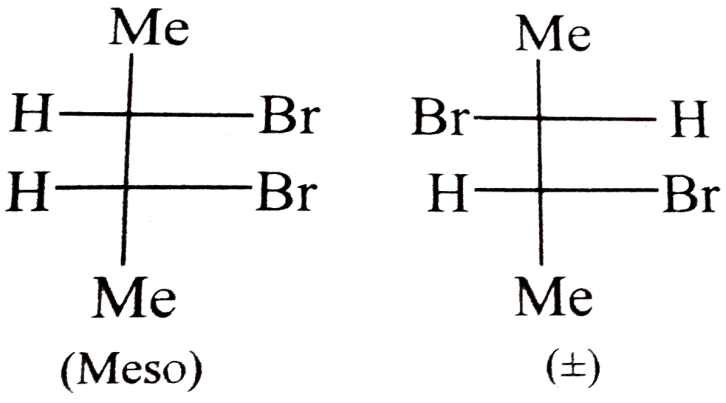
Watch Video Solution

28. What are the products of addition of D_2 to trans-2-pentene.

Watch Video Solution

29. Meso-2,3-dibromobutane reacts with iodide ion more rapidly than does ($\pm$) compounds. What are the respective alkenes formed ?

Explain.



(*trans*-Elimination)

Watch Video Solution

30. Mustard gas $(ClCH_2CH_2)_2 - S$ hydrolysed by water to $Cl(CH_2)_2S(Ch_2)_2OH$ much faster than expected for a primary halide. Offer an explanation.

Watch Video Solution

31. Give the product, indicating stereo-chemistry of cyclohexene with :

(a) Br_2

(b) $Br_2 \text{in} NaCl$

(c) $Br_2 \text{in} CH_3OH$

(d) $Br_2 \text{in} H_2O$

(e) KI / H_3PO_4.

Watch Video Solution

32. 1,2-Dimethylcyclohexene undergoes only trans-addition with HBr in non-polar solvents but both cis-and trans-additions occur with aq. Acid. Explain.

View Text Solution

33. Complete the following and state the relations between configurations of the reactant and products.

(i) $._{D-}\ MeCH(OH)Et + Ac_2O \rightarrow$?

(ii) $._{D-}\ MeCH(Cl)COOH + 2NaOH \rightarrow$?

Watch Video Solution

Subjective

1. Complete the following and state the relations between configurations of the reactant and products.

(i) $._{L}\ - MeCH(OH)Et + HBr \rightarrow$?

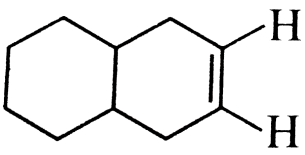
(ii) $._{L}\ - MeCH(OAc)Et + 2NaOH \rightarrow$?

(iii) $._{L}\ - MeEtPrCOMe + HI \rightarrow$?

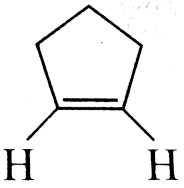
Watch Video Solution

2. What are the products and types of isomers when Br_2 adds to :

a.



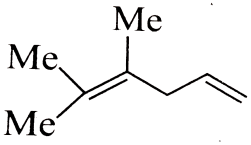
b.



Watch Video Solution

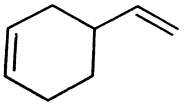
3.

3. a.



$\xrightarrow[+ CHCl_3 \text{ at } 25°C]{PhCO_3H \text{ (1 mol)}/H_3O^{\oplus}}$ (A)

b.

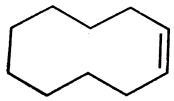


$\xrightarrow[+ CHCl_3 \text{ at } 25°C]{PhCO_3H \text{ (1 mol)}/H_3O^{\oplus}}$ (A)

Watch Video Solution

4. Give the stereochemical products of the following :

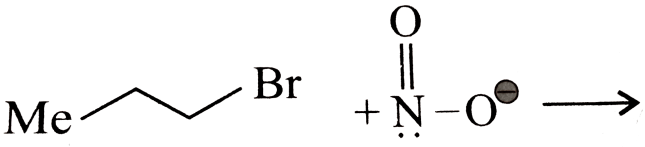
(i) $CH \equiv CH + Br_2 \rightarrow (A) \xrightarrow[KMnO_4]{Aq}$

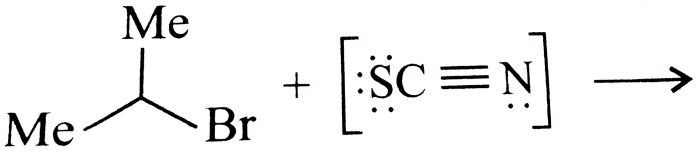
ii.  $+ Br_2, CCl_4 \longrightarrow (A) \xrightarrow[NaNH_2,\ 150\ C]{} (B)$

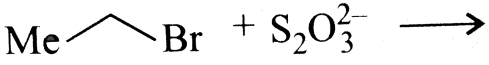
$\xrightarrow[C_2H_5OH]{Na/liq.\ NH_3} (C)$

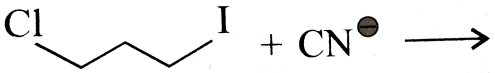
Watch Video Solution

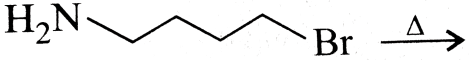
5. Give the products of the following organic reactions :

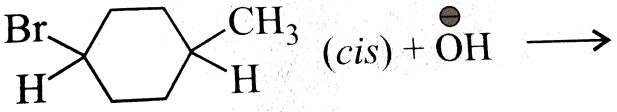
a. 

b. 

c. 

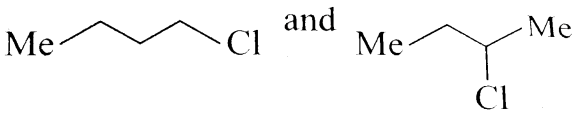
d. 

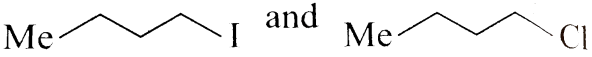
e. 

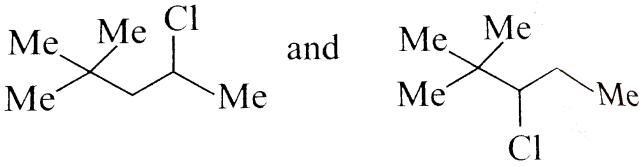
f. 

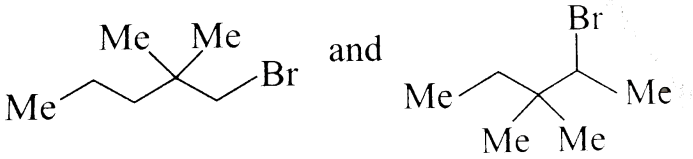
Watch Video Solution

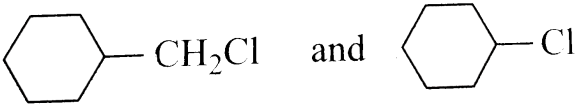
6. Of the following pairs, which is the faster SN^2 reactions ?

a. 

b. 

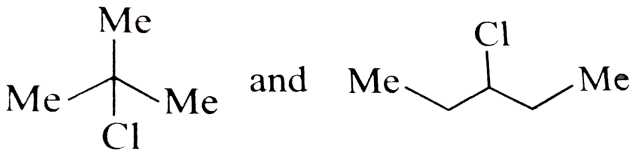
c. 

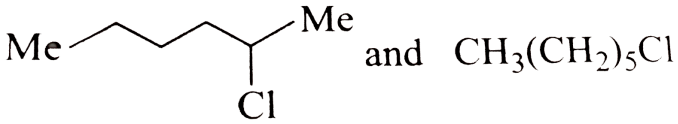
d. 

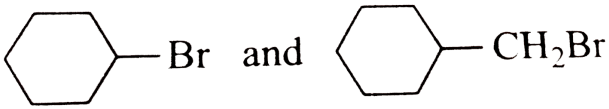
e. 

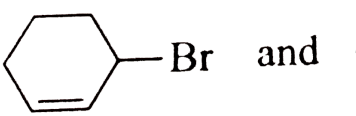
Watch Video Solution

7. Of the following pairs, which is the faster SN^1 reactions ?

a. 

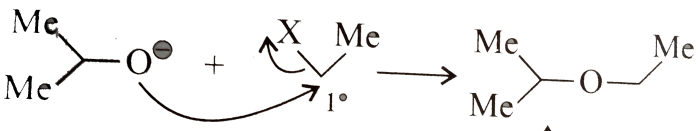
b. 

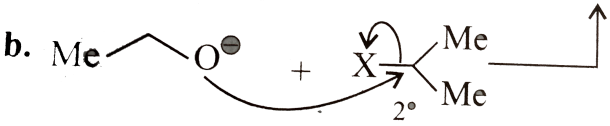
c. 

d. 

Watch Video Solution

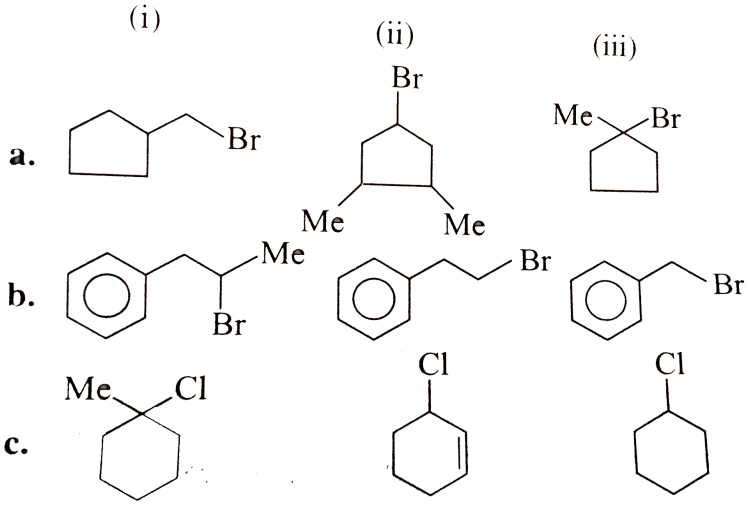
8. Which of the following would give a better yield of ether ?

a. 

b. 

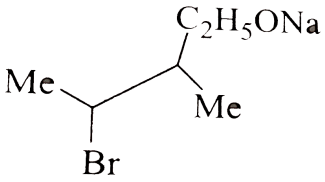
Watch Video Solution

9. Give the decreasing order of SN^1 reactions of the following compounds in H_2O.

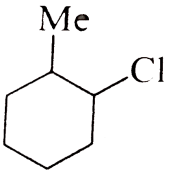


Watch Video Solution

10. Give the major product when the following compounds are reacted with C_2H_5ONa.

a. 

b. 

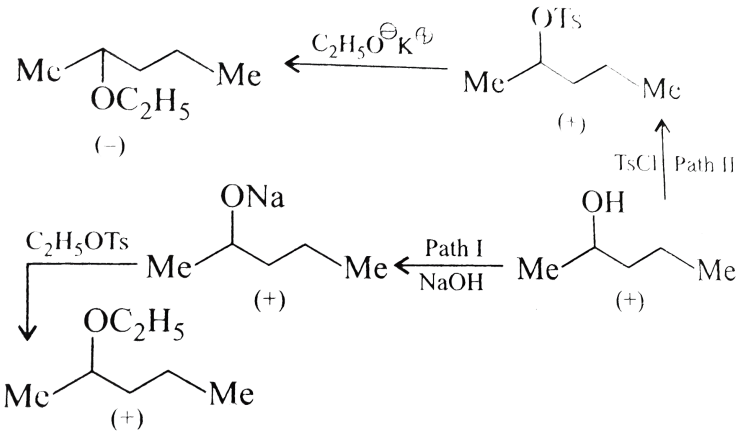
c. 

Watch Video Solution

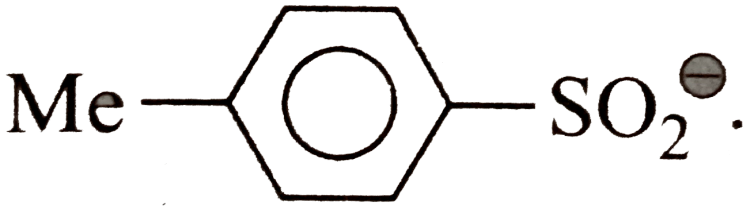
11. 2-Bromo pentane when treated with acl. KOH yields a mixture of three alkenes $(A), (B), (C)$. Indentity them and find out which is predominant ?

Watch Video Solution

12. 2-Pentanol can coverted to 2-ethoxy pentane by two paths. In path I, configuration at chiral C is retained but at path II, configuration is inverted. Explain.



,



Tosyl (Ts) is .

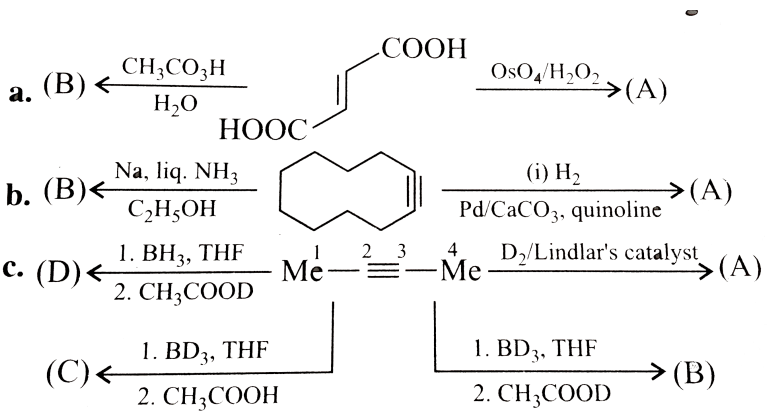
Watch Video Solution

13. When

reacts with alcoholic KCN, a mixture of isomeric products is obtained. Explain.

Watch Video Solution

14. Give the stereochemical products of the following :



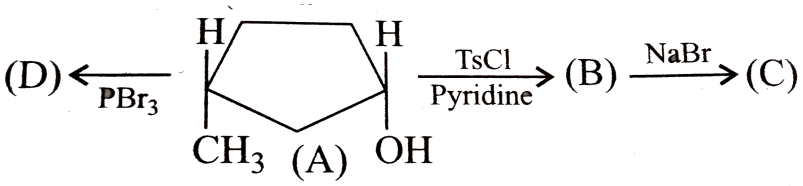
Watch Video Solution

15. Give the sterochemical products :

$$HC \equiv CH + 2NaNH_2 + 2EtBr \rightarrow (A) \xrightarrow{Cs,NH_3} (B) \xrightarrow{Br_2} (C).$$

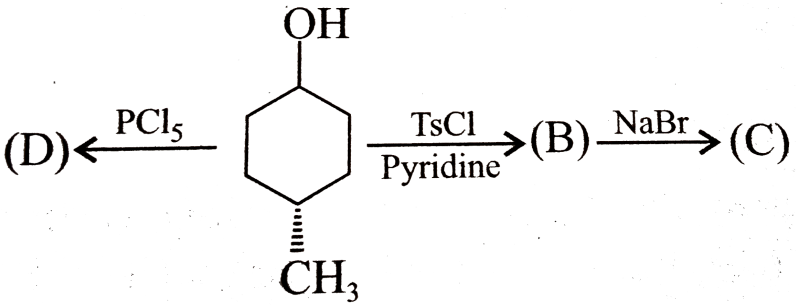
Watch Video Solution

16. Identify $(B), (c),$ and (D).



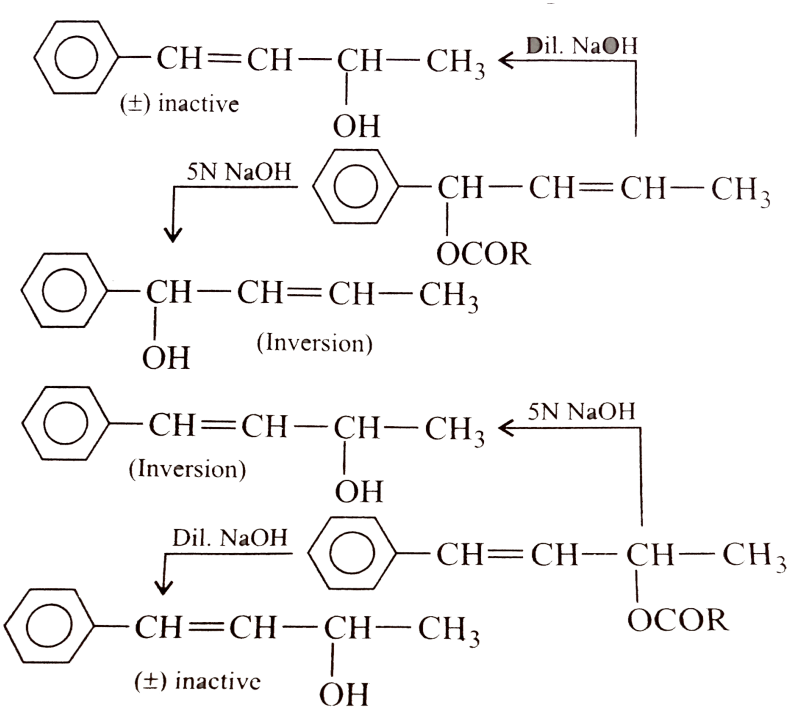
Watch Video Solution

17.



Watch Video Solution

18. Explain the difference in the following reactions.



Watch Video Solution

19. Predict the products with configurations in the following.

(a) $(+)2-\text{Octanol} + PhSO_2Cl \rightarrow (A) \xrightarrow[NaOH]{Hot} (B)$

(b) $(+)2-\text{Octanol} + CH_3COCl \rightarrow (C) \xrightarrow[NaOH]{Hot} (D)$

(c) $CH_3O^*H + PhSO_2Cl \rightarrow (E) \xrightarrow[NaOH]{Hot} (F) + (G)$

(d) $CH_3O^*H + CH_3COCl \rightarrow (H) \xrightarrow[NaOH]{Hot} (I) + (J).$

Watch Video Solution

Comprehension

1. The leaving group is that functional group which is ejected with $\bar{e}'s$ of the σ -bond in a reaction. Better the leaving group, faster is the reaction. The relative leaving ability of the leaving group X in $(R-X)$ is increased by :

(i) The polarisability of $(R-X)$ bond.

(ii) The stability of $X^{\ominus}$.

(iii) The degree of stabilisation through solvation of X.

(iv) The strength of $(R-X)$ bond.

The leaving group tendency is also called fugacity.

Which statement is wrong ?

A. In polar aprotic solvents such as $DMSO$, DMF, and DMA, the fugacity order is $I^{\ominus} > Br^{\ominus} > Cl^{\ominus} > F^{\ominus}$.

B. Strong bases are good leaving groups.

C. The leaving group order of the following is :

$\overset{\ominus}{O}H > RO^{\ominus} > CH \equiv C^{\ominus} > \overset{\ominus}{N}H_2$.

D. Charges species are good leaving groups than neutral species.

Answer: B

Watch Video Solution

2. The leaving group is that functional group which is ejected with $\bar{e}'s$ of the σ -bond in a reaction. Better the leaving group, faster is the reaction. The relative leaving ability of the leaving group X in $(R - X)$ is increased by :

(i) The polarisability of $(R - X)$ bond.

(ii) The stability of $X^{\ominus}$.

(iii) The degree of stabilisation through solvation of X.

(iv) The strength of $(R - X)$ bond.

The leaving group tendency is also called fugacity.

Which statement is correct ?

A. Only SN^1 reaction depends on the nature of leaving group.

B. Only SN^1 reaction depends on the nature of leaving group.

C. Both SN^1 and SN^2 reactions depends on the nature of leaving group.

D. All

Answer: C

Watch Video Solution

3. The leaving group is that functional group which is ejected with $\bar{e}'s$ of the σ -bond in a reaction. Better the leaving group, faster is the reaction. The relative leaving ability of the leaving group X in

$(R-X)$ is increased by :

(i) The polarisability of $(R-X)$ bond.

(ii) The stability of $X^{\ominus}$.

(iii) The degree of stabilisation through solvation of X.

(iv) The strength of $(R-X)$ bond.

The leaving group tendency is also called fugacity.

Which one of the followingd has the highest fugacity ?

A. Tosylate $\left(\overset{\ominus}{O}Ts\right)$

B. Mesylate

C. Triflate $\left(F_3C-SO_3^{\ominus}\right)$

D. All are equal

Answer: C

Watch Video Solution

4. The leaving group is that functional group which is ejected with $\bar{e}'s$ of the σ -bond in a reaction. Better the leaving group, faster is the reaction. The relative leaving ability of the leaving group X in $(R-X)$ is increased by :

(i) The polarisability of $(R-X)$ bond.

(ii) The stability of $X^{\ominus}$.

(iii) The degree of stabilisation through solvation of X.

(iv) The strength of $(R-X)$ bond.

The leaving group tendency is also called fugacity.

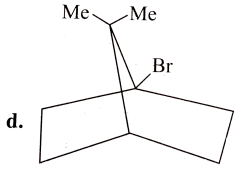
Which of the following undergoes SN reaction easily ?

A. Vinyl bromide

B. Bromobenzene

C. p-Nitro bromobenzene

D.



Answer: C

Watch Video Solution

5. The leaving group is that functional group which is ejected with $\bar{e}'s$ of the σ -bond in a reaction. Better the leaving group, faster is the reaction. The relative leaving ability of the leaving group X in $(R-X)$ is increased by :

(i) The polarisability of $(R-X)$ bond.

(ii) The stability of $X^{\ominus}$.

(iii) The degree of stabilisation through solvation of X.

(iv) The strength of $(R-X)$ bond.

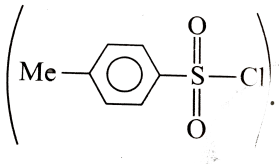
The leaving group tendency is also called fugacity.

Which statement is correct ?

A. $EtO^{\ominus}$ is a strong base and therefore a good leaving group.

B. The amine group in $ArNH_2$ is converted into a good leaving group be reacting $ArNH_2$ with $NaNO_2 + HCl$ at $0^\circ C$.

C. The (OH) group is converted into a good leaving group by reacting alcohols with $TsCl$ (p-toluene sulphonyl chloride)



D. The amine group in RNH_2 is converted into leaving group by reacting RNH_2 with $NaNO_2 + HCl$ at $0^\circ C$.

Answer: C

Watch Video Solution

6. The leaving group is that functional group which is ejected with $\bar{e}'s$ of the σ -bond in a reaction. Better the leaving group, faster is the reaction. The relative leaving ability of the leaving group X in

$(R - X)$ is increased by :

(i) The polarisability of $(R - X)$ bond.

(ii) The stability of $X^{\ominus}$.

(iii) The degree of stabilisation through solvation of X.

(iv) The strength of $(R - X)$ bond.

The leaving group tendency is also called fugacity.

Which of the following is the wrong order of fugacity ?

A. $SbH_3 > AsH_3 > PH_3 > NH_3$

B. $F^{\ominus} > \overset{\ominus}{O}H > \overset{\ominus}{N}H_2 > \overset{\ominus}{C}H_3$

C.

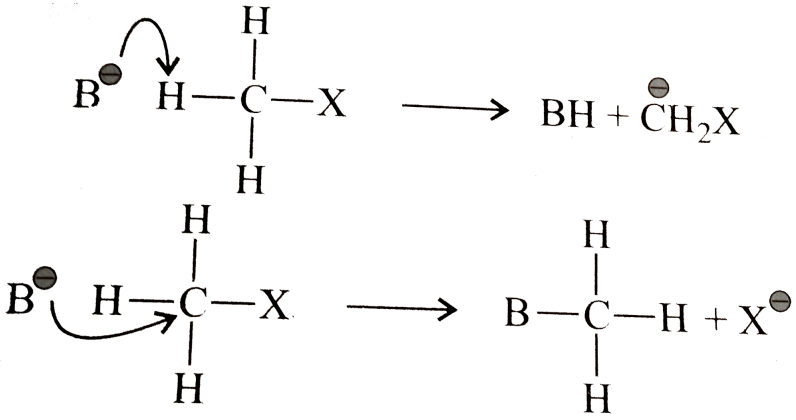
$$NH_3 > NH_2 - NH_2 > MeNH - NH - Me > Me_2N - Nme_2$$

D. $\overset{\ominus}{C}N > \overset{\ominus}{O}H > MeO > \overset{\ominus}{C}H_3.$

Answer: D

Watch Video Solution

7. The rate of SN^2 reaction depends on the effectiveness of the nucleophile in ejecting the leaving group. Nucleophilicity is the affinity for C atom, while basicity is the affinity for proton.



In both cases, a new bond is formed. If a new bond is formed between the anion and proton, the specied acts as a base. If a new bond is formed between the anion and C atom, the species acts as nucleophile.

Which of the following statements is wrong ?

A. The nucleophilicity order in non-polar solvents (e.g., CCl_4, CS_2) of the followind is :

$I^{\ominus} > Br^{\ominus} > Cl^{\ominus} > F^{\ominus}$.

B. The nucleophilicity order in polar protic solvents (e.g., H_2O) of the following is :

$I^{\Theta} > Br^{\Theta} > Cl^{\Theta} > F^{\Theta}$.

C. The nucleophilicity order in weakly polar protic solvents (e.g., nitro benzene, acetone) of the following is :

$F^{\Theta} > Cl^{\Theta} > Br^{\Theta} > I^{\Theta}$.

D. The nucleophilicity order in polar aprotic solvents (e.g., $DMSO, DMF$) of the following is :

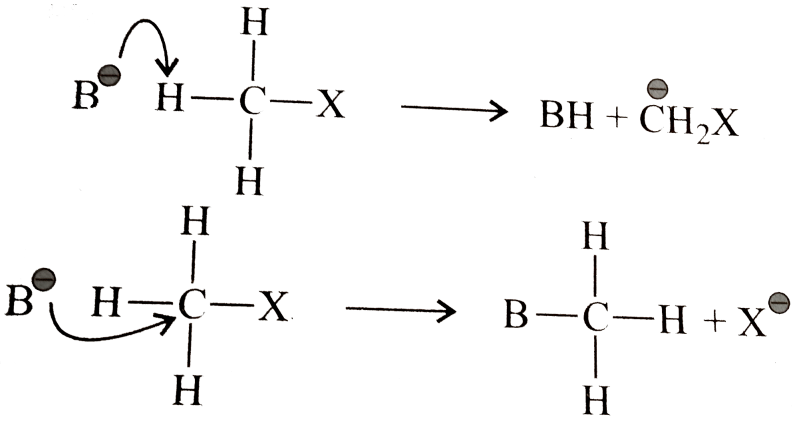
$F^{\Theta} > Cl^{\Theta} > Br^{\Theta} > I^{\Theta}$.

Answer: C

Watch Video Solution

8. The rate of SN^2 reaction depends on the effectiveness of the nucleophile in ejecting the leaving group. Nucleophilicity is the

affinity for C atom, while basicity is the affinity for proton.



In both cases, a new bond is formed. If a new bond is formed between the anion and proton, the specied acts as a base. If a new bond is formed between the anion and C atom, the species acts as nucleophile.

Which of the following statements is wrong ? Nucleophile order of the following in weakly polar aprotic solvents, e.g., acetone is :

A. $LiI > LiBr > LiCl > \ > LiF.$

B. $CsF > RbF > KF > NaF > LiF$

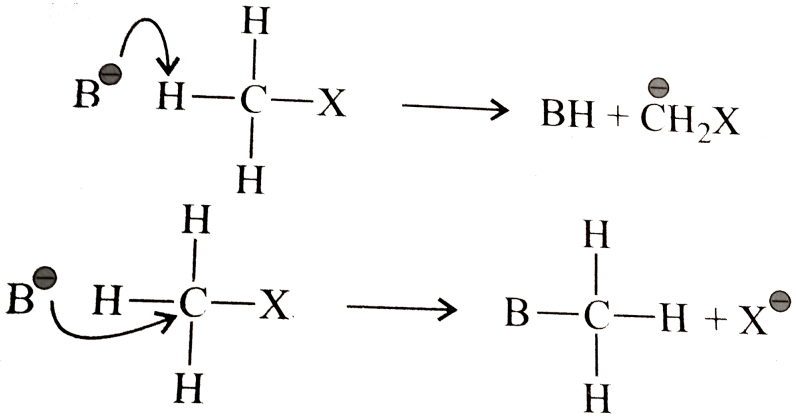
C. $R_4N^{\oplus}I^{\ominus} > R_4N^{\oplus}Br^{\ominus} > R_4N^{\oplus}Cl^{\ominus}$ (R = Butyl group)

D. All

Answer: C

Watch Video Solution

9. The rate of SN^2 reaction depends on the effectiveness of the nucleophile in ejecting the leaving group. Nucleophilicity is the affinity for C atom, while basicity is the affinity for proton.



In both cases, a new bond is formed. If a new bond is formed between the anion and proton, the specied acts as a base. If a new bond is formed between the anion and C atom, the species acts as nucleophile.

Which of the following is wrong ?

A. The decreasing basic order of the following is :

$$NH_3 > PH_3 > AsH_3 > SbH_3$$

B. The decreasing basic order of the following is :

$$\overset{\ominus}{C}H_3 > \overset{\ominus}{N}H_2 > \overset{\ominus}{O}H > F^{\ominus}.$$

C. The decreasing nucleophilic order of the following is :

$$\overset{\ominus}{C}H_3 < \overset{\ominus}{N}H_2 < \overset{\ominus}{O}H < F^{\ominus}.$$

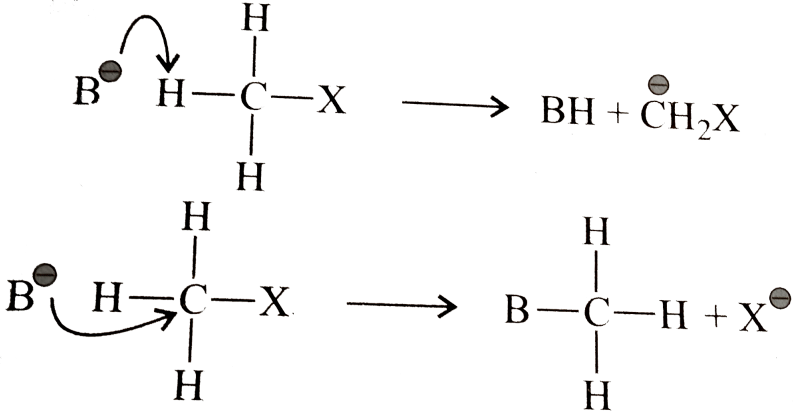
D. The decreasing basic and nucleophilic order of the following is :

$$\overset{\ominus}{C}H_3 > H^{\ominus} > \overset{\ominus}{O}H > \overset{\ominus}{O}Me > \overset{\ominus}{C}N.$$

Answer: C

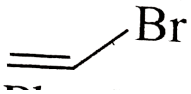
Watch Video Solution

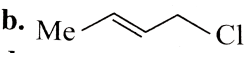
10. The rate of SN^2 reaction depends on the effectiveness of the nucleophile in ejecting the leaving group. Nucleophilicity is the affinity for C atom, while basicity is the affinity for proton.



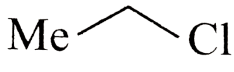
In both cases, a new bond is formed. If a new bond is formed between the anion and proton, the specied acts as a base. If a new bond is formed between the anion and C atom, the species acts as nucleophile.

Which of the following compounds gives SN^1, SN^2, and SN^2 mechanisms ?

A. 

B. 

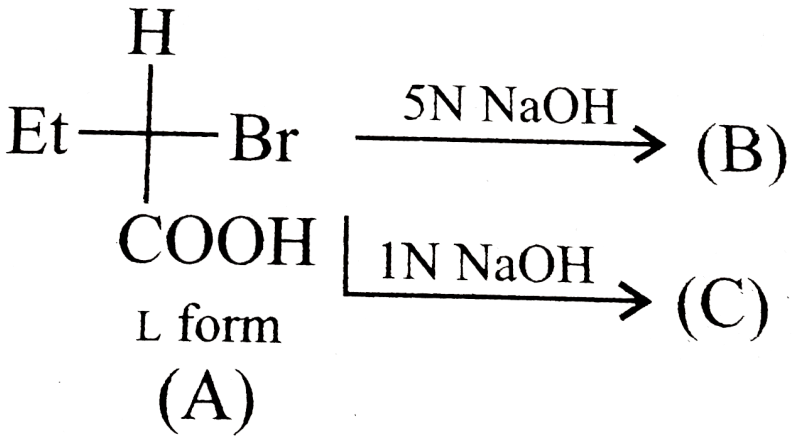
C. Ph-I

D. 

Answer: B

Watch Video Solution

11.



Which statement is wrong in the formation of (B) from (A).

A. It proceeds by SN^2 mechanism.

B. The configuration of product (B) is D form.

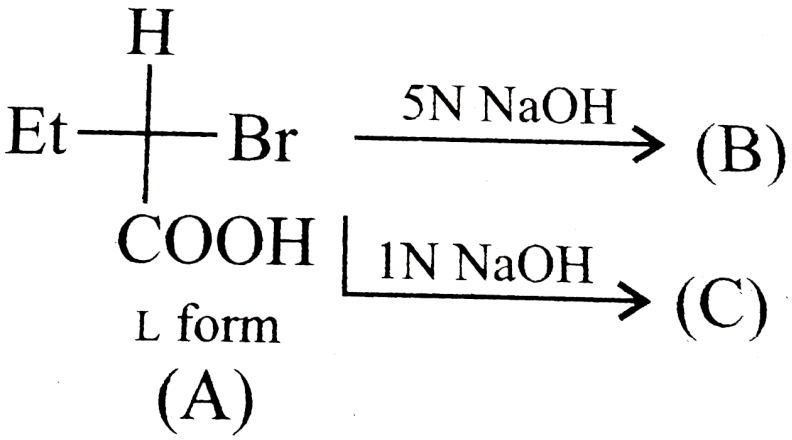
C. It proceeds by SN^1 mechanism

D. The Walden inversion occurs.

Answer: C

Watch Video Solution

12.



Which is correct in the formation of (c) from (A) ?

A. It proceeds by SN^1 mechanism.

B. Retention and racemisation take place.

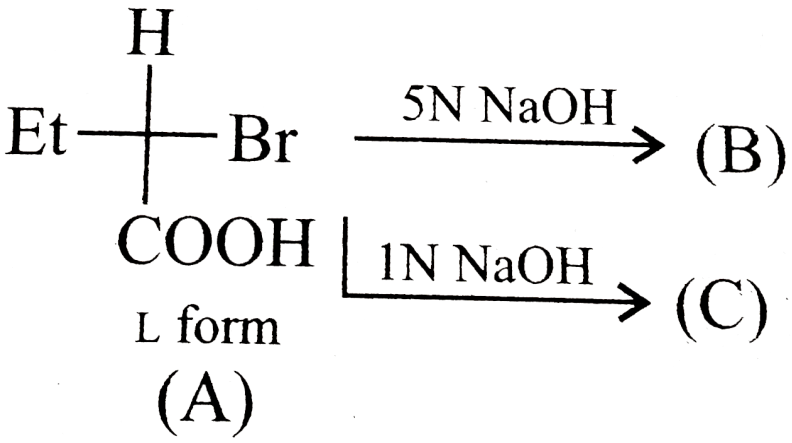
C. The configurations of (c) are DL and L.

D. It proceeds by SN^i mechanism.

Answer: A

Watch Video Solution

13.



Which statement is wrong in the formation of (c) from (A) ?

A. The retention of configuration of (A) takes place.

B. The configuration of (c) is L form.

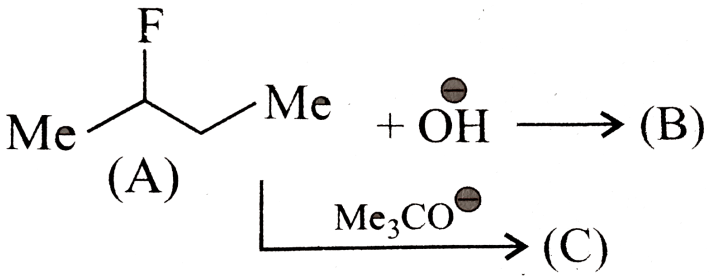
C. Due to the neighbouring group participation of $\left(COO^{\ominus}\right)$ group, the $\overset{\ominus}{O}H$ ion attacks from the same side and hence retension occurs.

D. The reaction proceeds by $SN^{2'}$ mechanism.

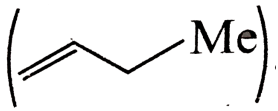
Answer: D

Watch Video Solution

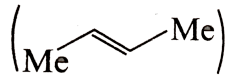
14. In elimination reaction, the major product is either Saytzeff (more-substituted alkene) or Hofmann product (less-substituted alkene) depending on the nature of the substrate and the nature of the base. Which statement is correct about the reactions ?



A. Both products (B) and (c) are Hofmann product.



B. Both products (B) and (c) are Saytzeff product.



C. product (B) is Hofmann and (c) is Saytzeff product.

D. Product (B) is Saytzeff and (c) is Hofmann product.

Answer: A

Watch Video Solution

15. In elimination reaction, the major product is either Saytzeff (more-substituted alkene) or Hofmann product (less-substituted alkene) depending on the nature of the substrate and the nature of the base. Refer to Q.No.14 and find out which statement is correct ?

A. Both reactions proceeds by $E2$ mechanism.

B. Both reactions proceed by $E1$ mechanism.

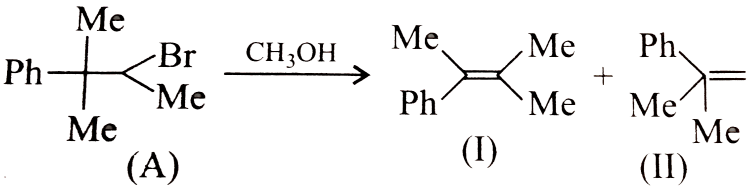
C. Formations of (B) and (c) proceed by $E1$ and $E2$ mechanisms, respectively.

D. Formations of (B) and (c) proceeds by $E2$ and $E1$ mechanism, respectively.

Answer: A

Watch Video Solution

16. In elimination reaction, the major product is either Saytzeff (more-substituted alkene) or Hofmann product (less-substituted alkene) depending on the nature of the substrate and the nature of the base. Which statement is correct about the following reactions ?



A. The major product is (I) by $E1$ machanism.

B. The major product is (I) by $E2$ machanism.

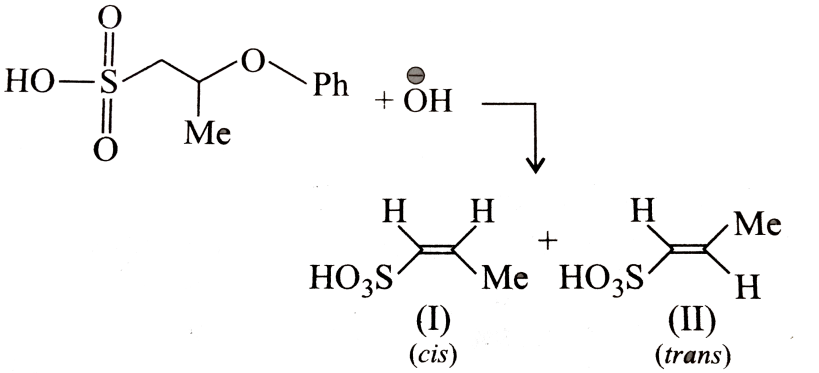
C. The major product is (II) by $E1$ machanism.

D. The major product is (II) by $E2$ mechanism.

Answer: A

Watch Video Solution

17. In elimination reaction, the major product is either Saytzeff (more-substituted alkene) or Hofmann product (less-substituted alkene) depending on the nature of the substrate and the nature of the base. Which statement is wrong about the given reaction.



A. The reaction proceeds by $E1cB$ mechanism.

B. $EWG(-SO_3H)$ stabilities the carbanion formed in the first step.

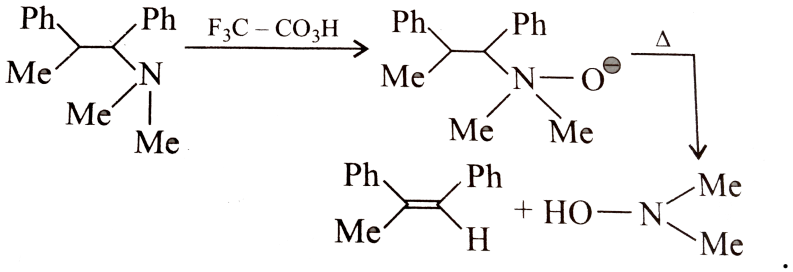
C. The reaction in stereospecific but non-regioselective

D. $PhO^{\ominus}$ is a stronger base than $\overset{\ominus}{O}H$ ion.

Answer: D

Watch Video Solution

18. In elimination reaction, the major product is either Saytzeff (more-substituted alkene) or Hofmann product (less-substituted alkene) depending on the nature of the substrate and the nature of the base. Which statement is wrong about the given reaction ?



A. The reaction is called Cope reaction and proceeds by $E1$ mechanism.

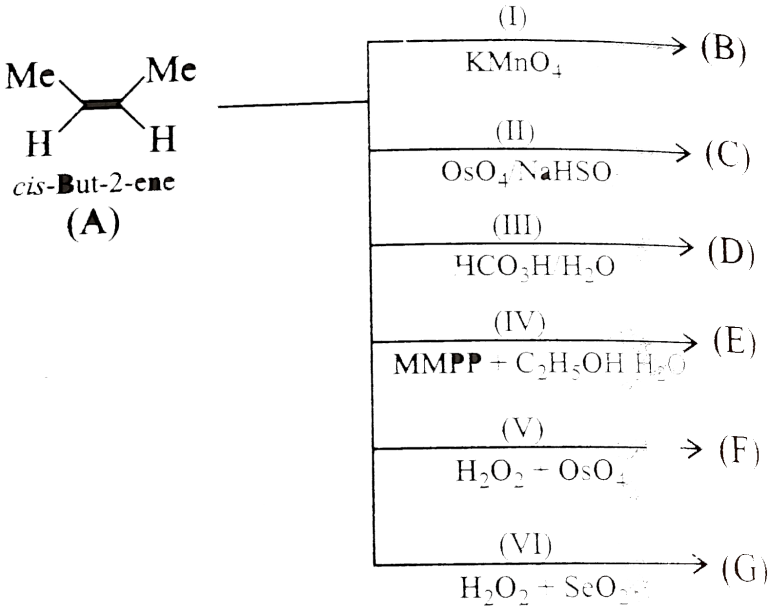
B. The reaction proceedsby syn-elimination.

C. The reaction is stereospecific and stereselective.

D. The reaction is non-stereospecific and regioselective.

Answer: D

19. Consider the following reactions :



Which of the following are stereospecific reactions ?

A. $(I), (II)$

B. $(I), (II), (III)$

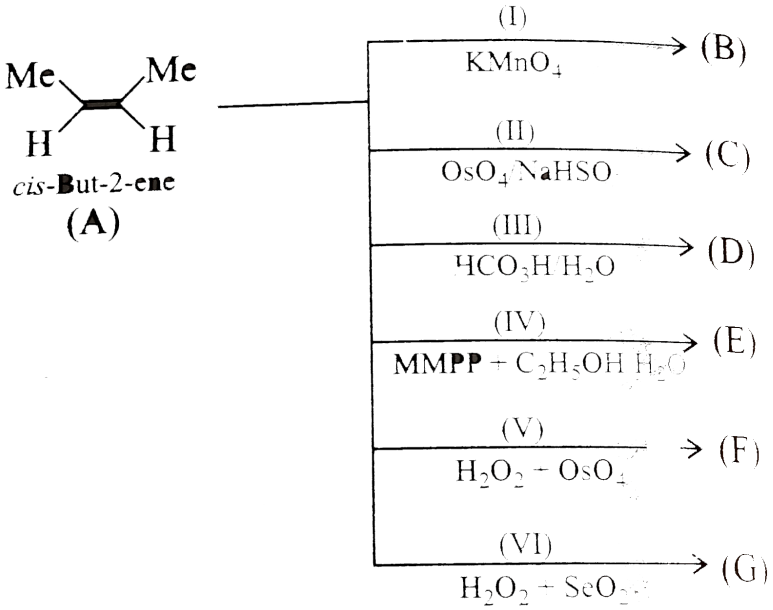
C. $(III), (IV), (V)$

D. All

Answer: D

Watch Video Solution

20. Consider the following reactions :



Which of the following regioselective reactions ?

A. $(I), (II), (V)$

B. $(III), (IV), (VI)$

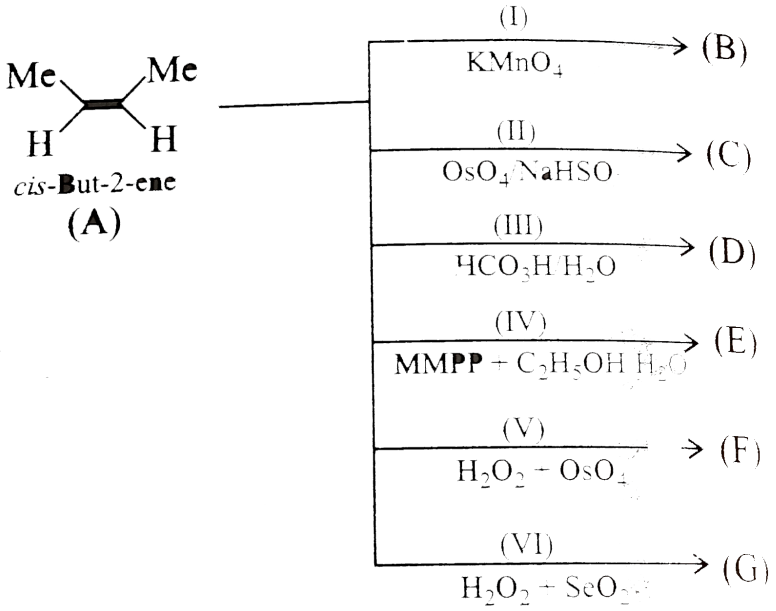
C. $(I), (II), (IV)$

D. $(III), (IV), (V)$

Answer: A

Watch Video Solution

21. Consider the following reactions :



Syn-addition takes place in :

A. $(I), (II), (V)$

B. $(III), (IV), (VI)$

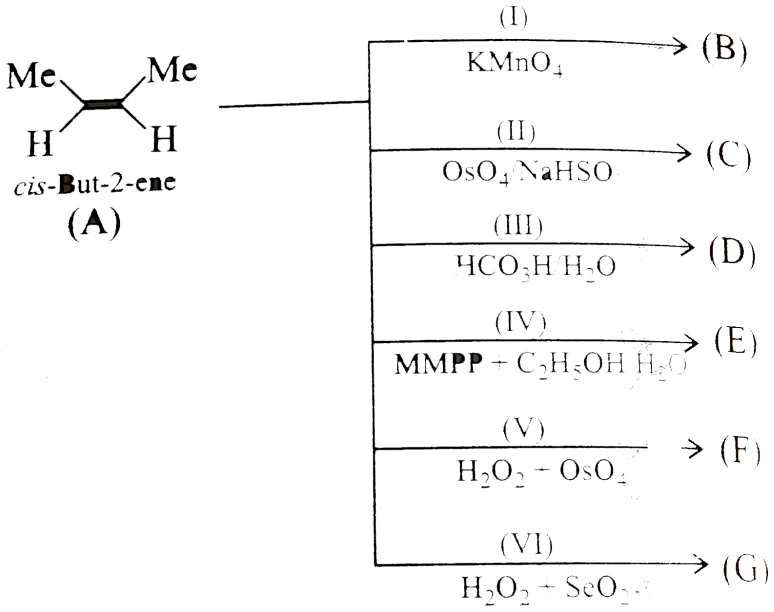
C. $(I), (II), (IV)$

D. $(III), (IV), (V)$

Answer: A

Watch Video Solution

22. Consider the following reactions :



Anti-addition takes place in :

A. $(I), (II), (V)$

B. $(III), (IV), (VI)$

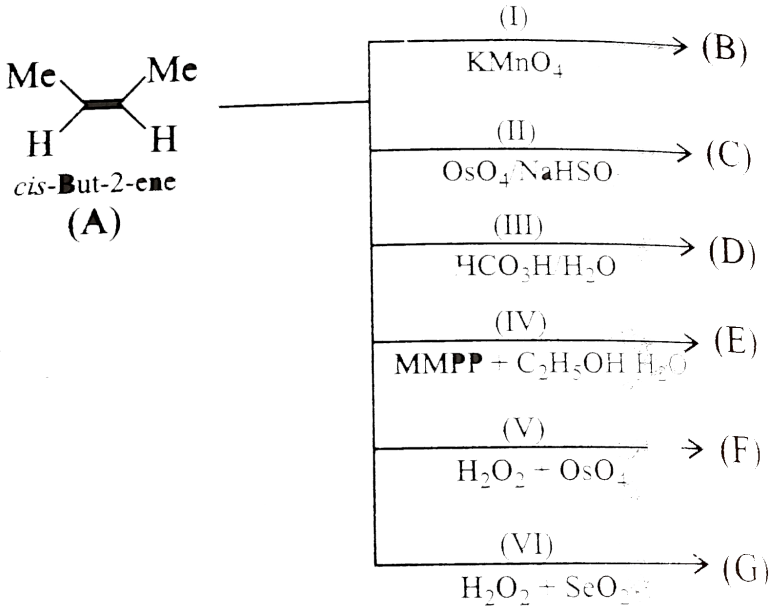
C. $(I), (II), (IV)$

D. $(III), (IV), (V)$

Answer: B

Watch Video Solution

23. Consider the following reactions :



Meso-butan-2,3-diol is formed in :

A. $(I), (II), (V)$

B. $(III), (IV), (VI)$

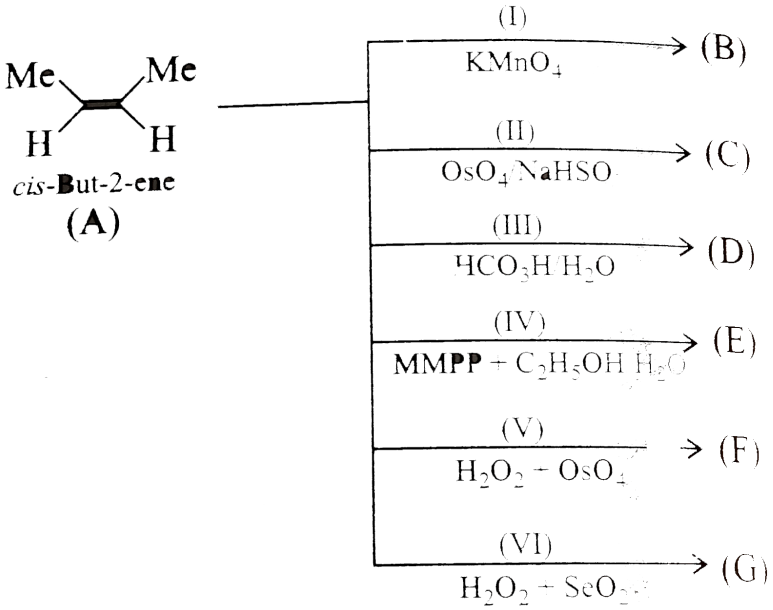
C. $(I), (II), (IV)$

D. $(III), (IV), (V)$

Answer: A

Watch Video Solution

24. Consider the following reactions :



Racemic-butan-2,3-diol is formed in :

A. $(I), (II), (V)$

B. $(III), (IV), (VI)$

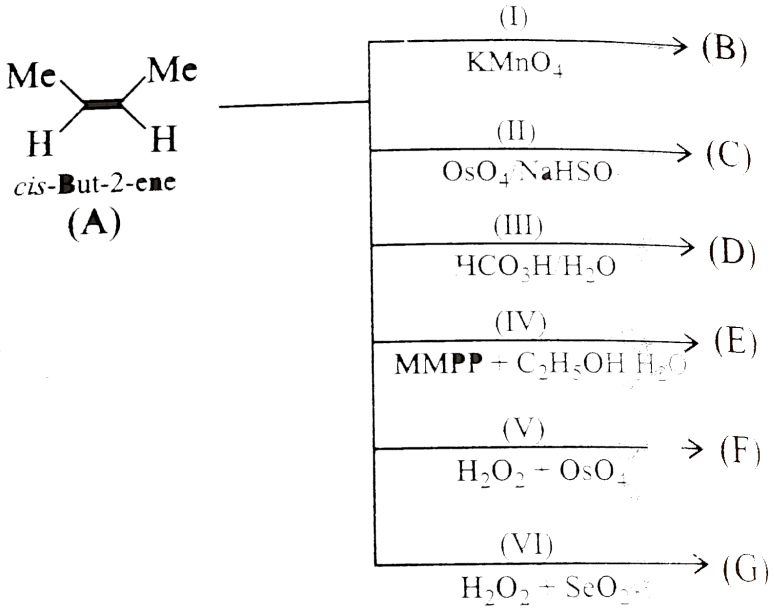
C. $(I), (II), (IV)$

D. $(III), (IV), (V)$

Answer: B

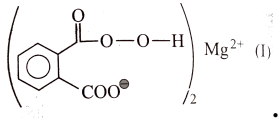
Watch Video Solution

25. Consider the following reactions :



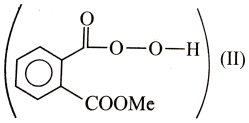
The name of structure of $MMPP$ is :

A. Magnesium monoperoxy phthalate



B. Megnesium perphthalate and structure (I)

C. Methyl monoperoxy phthalate



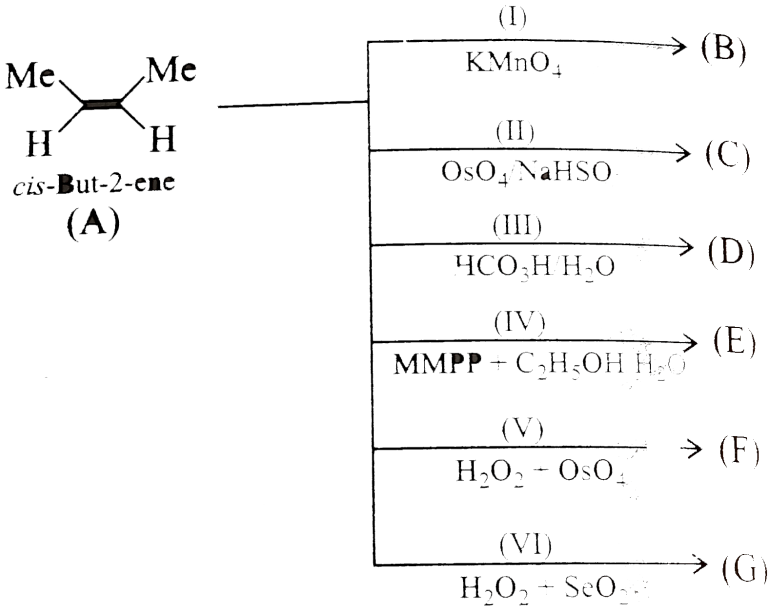
(II)

D. Methyl perphthalate and structure (II).

Answer: A::B

Watch Video Solution

26. Consider the following reactions :



Which of the following are stereospecific reactions ?

A. $(I), (II)$

B. $(I), (II), (III)$

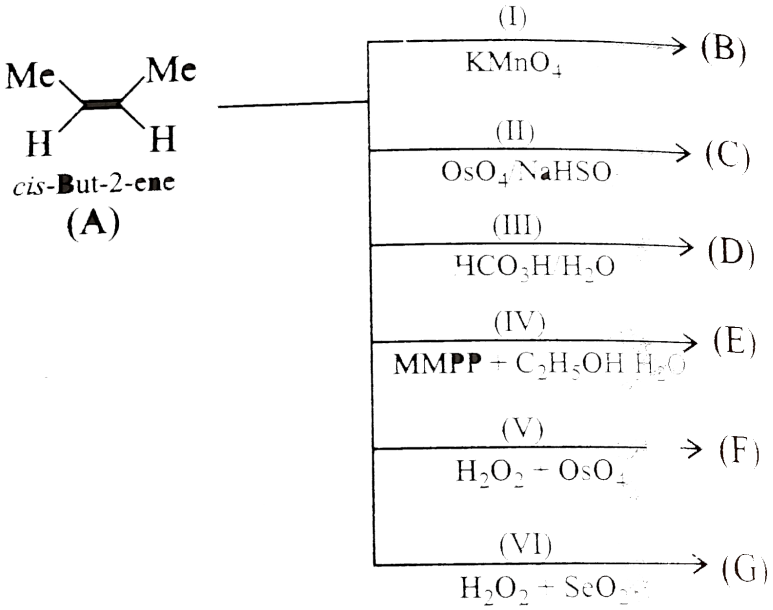
C. $(III), (IV), (V)$

D. All

Answer: D

Watch Video Solution

27. Consider the following reactions :



Which of the following regioselective reactions ?

A. $(I), (II), (V)$

B. $(III), (IV), (VI)$

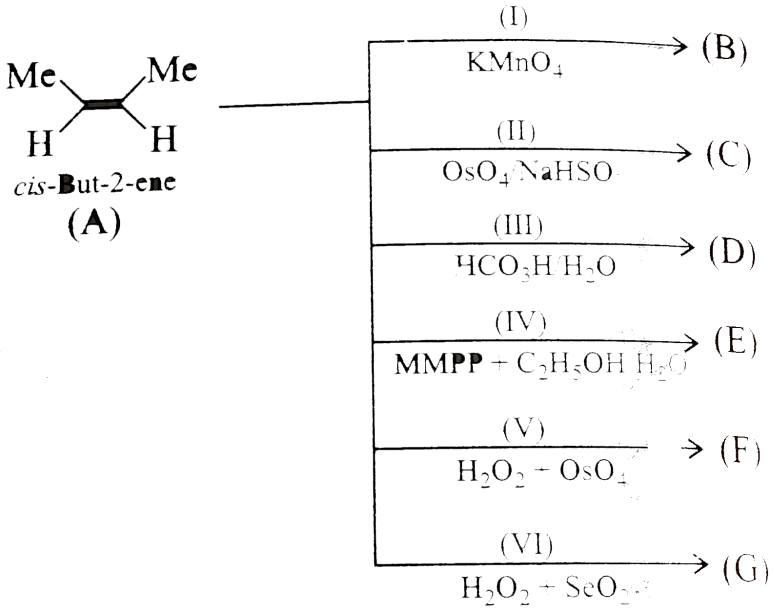
C. $(I), (II), (IV)$

D. $(III), (IV), (V)$

Answer: B

Watch Video Solution

28. Consider the following reactions :



Syn-addition takes place in :

A. $(I), (II), (V)$

B. $(III), (IV), (VI)$

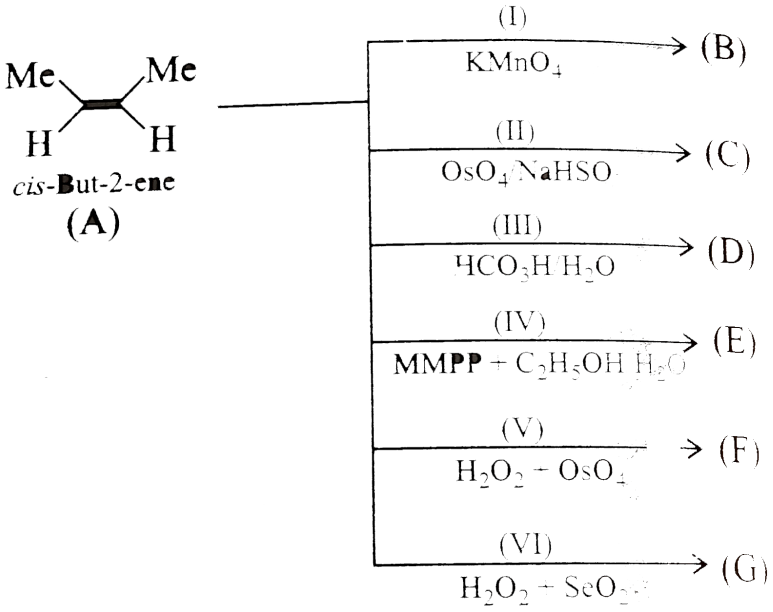
C. $(I), (II), (IV)$

D. $(III), (IV), (V)$

Answer: A

Watch Video Solution

29. Consider the following reactions :



Syn-addition takes place in :

A. $(I), (II), (V)$

B. $(III), (IV), (VI)$

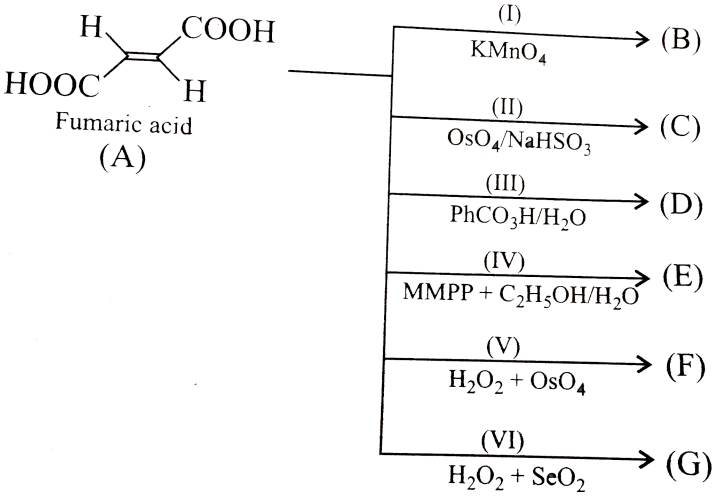
C. $(I), (II), (IV)$

D. $(III), (IV), (V)$

Answer: B

Watch Video Solution

30.



Meso-tartaric acid is formed in :

A. $(I), (II), (V)$

B. $(III), (IV), (VI)$

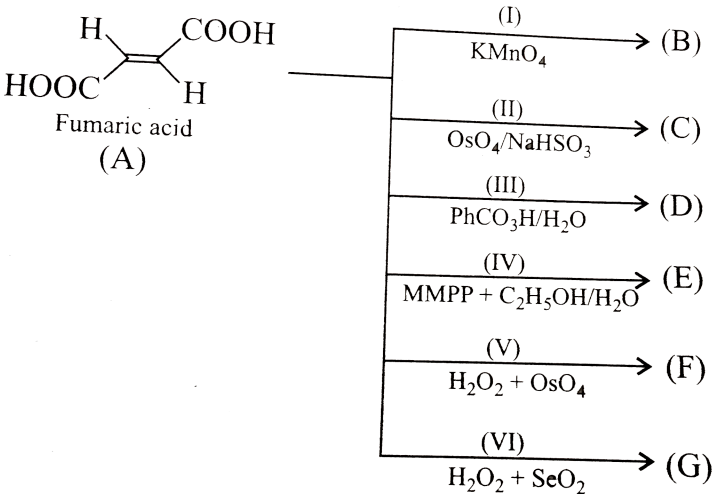
C. $(I), (II), (IV)$

D. $(III), (IV), (V)$

Answer: B

Watch Video Solution

31.



$(\pm)$ -Tartaric acid is formed in :

A. $(I), (II), (V)$

B. $(III), (IV), (VI)$

C. $(I), (II), (IV)$

D. $(III), (IV), (V)$

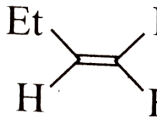
Answer: A

Watch Video Solution

32. Consider the following reactions :

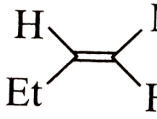
$$IMe - \underset{(A)}{\equiv} - Me \xrightarrow[EtOH]{Na+Liq.NH_3} (B)$$

ii. (A) $\xrightarrow{H_2 + \text{Poisoned Pd}}$ (C)

iii.  $\xrightarrow{Br_2/CCl_4}$ (E)

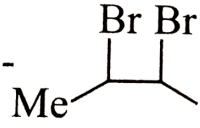
(D)

iv. (D) $\xrightarrow{Br_2/H_2O}$ (F)

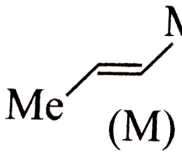
v.  $\xrightarrow{Br_2/CCl_4}$ (H)

(G)

vi. (G) $\xrightarrow{Br_2/H_2O}$ (I)

vii. Erythro-  $\xrightarrow[\text{Acetone}]{\text{NaI}}$ (K)

viii. Threo-(J) $\xrightarrow[\text{Acetone}]{\text{NaI}}$ (L)

ix.  $\xrightarrow{CH_2N_2 + h\nu}$ (N)

(M)

x. (M) $\xrightarrow[+ h\nu]{CH_2=C=O}$ (O)

Which statement is wrong about the reactions (i) and (ii) ?

A. The product (B) is trans-but-2-ene and (c) is cis-but-2-ene.

B. The product (B) is cis-but-2-ene and (C) is trans-but-2-ene.

C. The formation of (B) and (c) takes place by anti-and syn-addition of H_2, respectively.

D. In the formation of (B), one of the intermediate species is radical anion.

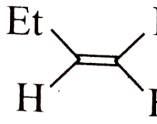
Answer: B

Watch Video Solution

33. Consider the following reactions :

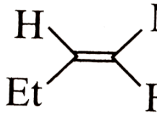
$$IMe - \underset{(A)}{\equiv} - Me \xrightarrow[EtOH]{Na+Liq.NH_3} (B)$$

ii. (A) $\xrightarrow{H_2 + \text{Poisoned Pd}}$ (C)

iii.  $\xrightarrow{Br_2/CCl_4}$ (E)

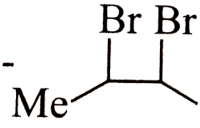
(D)

iv. (D) $\xrightarrow{Br_2/H_2O}$ (F)

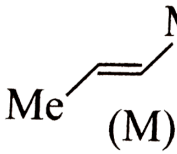
v.  $\xrightarrow{Br_2/CCl_4}$ (H)

(G)

vi. (G) $\xrightarrow{Br_2/H_2O}$ (I)

vii. Erythro-  $\xrightarrow[\text{Acetone}]{NaI}$ (K)

viii. Threo-(J) $\xrightarrow[\text{Acetone}]{NaI}$ (L)

ix.  $\xrightarrow{CH_2N_2 + h\nu}$ (N)

(M)

x. (M) $\xrightarrow[+ h\nu]{CH_2=C=O}$ (O)

Which statement is wrong about the reactions (iii) and (iv) ?

A. Anti-addition takes place in both the reactions.

B. The product in both the reactions is racemic mixture.

C. Both the reactions are stereospecific and regioselective.

D. Both the reactions are EA(electrophilic addition) reaction.

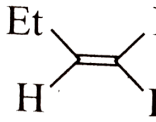
Answer: C

Watch Video Solution

34. Consider the following reactions :

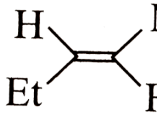
$$IMe - \underset{(A)}{\equiv} - Me \xrightarrow[EtOH]{Na+Liq.NH_3} (B)$$

ii. (A) $\xrightarrow{H_2 + \text{Poisoned Pd}}$ (C)

iii.  $\xrightarrow{Br_2/CCl_4}$ (E)

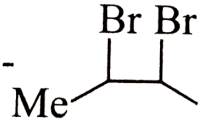
(D)

iv. (D) $\xrightarrow{Br_2/H_2O}$ (F)

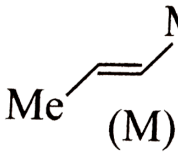
v.  $\xrightarrow{Br_2/CCl_4}$ (H)

(G)

vi. (G) $\xrightarrow{Br_2/H_2O}$ (I)

vii. Erythro-  $\xrightarrow[\text{Acetone}]{\text{NaI}}$ (K)

viii. Threo-(J) $\xrightarrow[\text{Acetone}]{\text{NaI}}$ (L)

ix.  $\xrightarrow{CH_2N_2 + h\nu}$ (N)

(M)

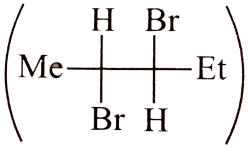
x. (M) $\xrightarrow[+ h\nu]{CH_2=C=O}$ (O)

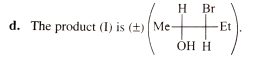
Which statement is wrong about the reaction (v) and (vi) ?

A. Syn-addition takes place in both the reactions.

B. The product in both reactions is racemic mixture.

C. The product (H) is $(\pm)$



D. 

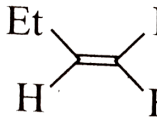
Answer: A

Watch Video Solution

35. Consider the following reactions :

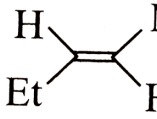
$$IMe - \underset{(A)}{\equiv} - Me \xrightarrow[EtOH]{Na+Liq.NH_3} (B)$$

ii. (A) $\xrightarrow{H_2 + \text{Poisoned Pd}}$ (C)

iii.  $\xrightarrow{Br_2/CCl_4}$ (E)

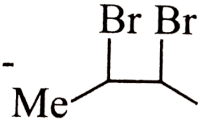
(D)

iv. (D) $\xrightarrow{Br_2/H_2O}$ (F)

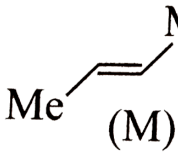
v.  $\xrightarrow{Br_2/CCl_4}$ (H)

(G)

vi. (G) $\xrightarrow{Br_2/H_2O}$ (I)

vii. Erythro-  $\xrightarrow[\text{Acetone}]{\text{NaI}}$ (K)

viii. Threo-(J) $\xrightarrow[\text{Acetone}]{\text{NaI}}$ (L)

ix.  $\xrightarrow{CH_2N_2 + h\nu}$ (N)

(M)

x. (M) $\xrightarrow[+ h\nu]{CH_2=C=O}$ (O)

Which statement is wrong about the reactions (vii) and (viii) ?

A. The product (K) is trans-but-2-ene and product (L) is cis-but-2-ene.

B. The product (K) is cis-bit-2-ene and product (L) is trans-but-2-ene.

C. Anti-elimination of Br_2 takes place in both the reactions.

D. Both the reactions proceed by $E2$ mechanism.

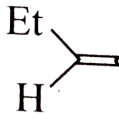
Answer: B

Watch Video Solution

36. Consider the following reactions :

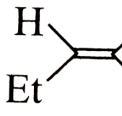
$$IMe - \underset{(A)}{\equiv} - Me \xrightarrow[EtOH]{Na+Liq.NH_3} (B)$$

ii. (A) $\xrightarrow{H_2 + \text{Poisoned Pd}}$ (C)

iii.  $\xrightarrow{Br_2/CCl_4}$ (E)

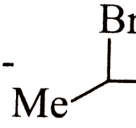
(D)

iv. (D) $\xrightarrow{Br_2/H_2O}$ (F)

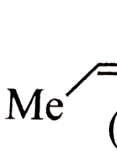
v.  $\xrightarrow{Br_2/CCl_4}$ (H)

(G)

vi. (G) $\xrightarrow{Br_2/H_2O}$ (I)

vii. Erythro-  $\xrightarrow[\text{Acetone}]{\text{NaI}}$ (K)

viii. Threo-(J) $\xrightarrow[\text{Acetone}]{\text{NaI}}$ (L)

ix.  $\xrightarrow{CH_2N_2 + h\nu}$ (N)

(M)

x. (M) $\xrightarrow[+ h\nu]{CH_2=C=O}$ (O)

Which statement is wrong about the reactions (ix) and (x) ?

A. Both the reactions are stereospecific and stereoselective.

B. Reaction (ix) is sterospecific and stereoselective.

C. Reaction (x) is neither stereospecific nor stereoselective.

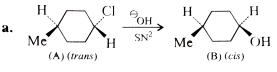
D. Reaction (ix) proceeds by singlet carbene and reaction (x) by triplet carbene.

Answer: A

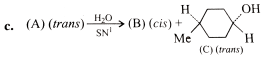
Watch Video Solution

Multiple Correct

1. Which of the following reactions are correct ?

A. 

B. (A) (trans) $\xrightarrow[SN^1]{\overset{\Theta}{OH}} (B)(cis)$

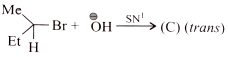
C. 

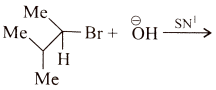
D. $(A)(trans) \xrightarrow[SN^1]{H_2O} (C)(trans)$

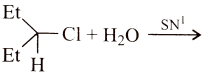
Answer: A::C

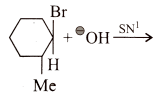
Watch Video Solution

2. Which of the following reactions would give racemised and retention products ?

A. a. 

B. b. 

C. c. 

D. d. 

Answer: A::C::D

Watch Video Solution

3. Which of the following statements are correct statements ?

A. Carbocation is less $\bar{e}$ deficient than alkyl radical.

B. Isomerisation of a less stable carbocation to more stable carbocation by $1, 2 - Me$ shift is called Wagner-Meerwein rearrangement.

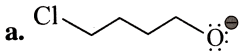
C. Isomerisation to a more stable carbocation is accompained by decrease in potential energy.

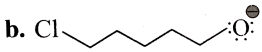
D. Greater stability of benzyl, allyl, and 3° carbocation is due to hyperconjugation.

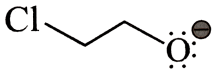
Answer: A::C::D

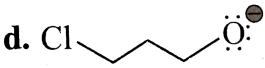
Watch Video Solution

4. In which of the following species containing both nucleophile and leaving group, intramolecular SN reaction occurs ?

A. 

B. 

C. 

D. 

Answer: A::B

Watch Video Solution

5. Which of the following statements are correct ?

A. The reaction of t-butyl chloride with $\overset{\ominus}{O}H$ follows first-order kinetics.

B. An SN^1 reaction proceeds with the inversion of configuration.

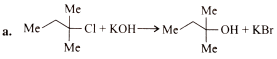
C. An SN^2 reaction follows second-order kinetics.

D. An SN^2 reaction proceeds with stereochemical inversion.

Answer: A::C::D

Watch Video Solution

6. Which of the following are SN^2 reactions ?

A. a. 

B. $Me_3C - Br + KOH \rightarrow Mr_3C - OH + KBr$

C. $Et - I + EtONa \rightarrow Et - O - Et + NaI$

D. $Et - Cl + NaOH \rightarrow EtOh + NaCl$

Answer: C::D

Watch Video Solution

7. Vinyl bromide undergoes :

A. Addition reaction

B. Substitution reaction

C. Elimination reaction

D. Rearrangement reaction

Answer: A::C

Watch Video Solution

8. The halogen atom in RX can easily be replaced by nucleophiles such as :

A. $NO_2^{\ominus}$

B. $RO^{\ominus}$

C. $CN^{\ominus}$

D. None

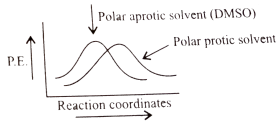
Answer: A::B::C

Watch Video Solution

9. Which of the following statements are correct ?

A. Polar protic solvents (e.g, $MeOH$, $EtOH$) form H-bonding to nucleophile and stabilise it, thus rate of SN^2 reaction is decreased.

B. Polar aprotic solvents (e.g., $DMSO$, DMF) raise the energy of the nucleophile and thus the rate of SN^2 is increased.



C. Reactivity of nucleophile in the presence of crown ether (solvent) is increased for SN^1 and SN^2 reactions.

D. Reactivity nucleophile in the presence of crown ether (solvent) is decreased for SN^1 and SN^2 reactions.

Answer: A::B::C

Watch Video Solution

10. Which of the following reactions represents SN reaction ?

A. $EtCl + EtSNa \rightarrow EtSEt + NaCl$

B. $EtCl + NaOH \rightarrow EtOH + KCl$

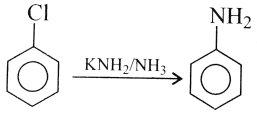
C. $EtCl + AgCH \rightarrow Et - \overset{\oplus}{N} \equiv \overset{\ominus}{C} + AgCl$

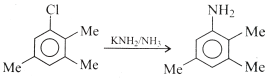
D. $EtCl + 2H \rightarrow C_2H_6 + HCl$

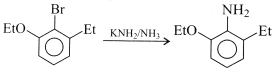
Answer: A::B::C

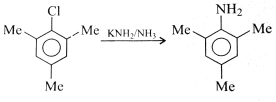
Watch Video Solution

11. Which of the following reactions are feasible ?

A. 

B. 

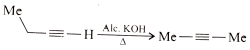
C. 

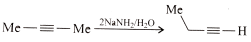
D. 

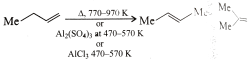
Answer: A::B

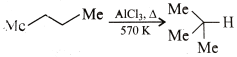
Watch Video Solution

12. Which of the following transformations are feasible ?

A. a. 

B. b. 

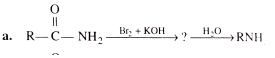
C. c. 

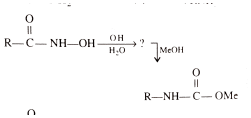
D. d. 

Answer: A::B::C::D

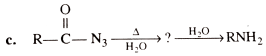
View Text Solution

13. In which of the following reactions, the intermediate species acyl nitrene $\left(R-\overset{\overset{O}{||}}{C}-\ddot{N}:\right)$ and intermediate compound alkyl isocyanate $(R-N=C=O)$ are involved ?

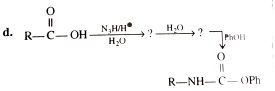
A. a. 

B. b. 

C.



D.



Answer: A::B::C::D

Watch Video Solution

14. Which of the following statements are correct ?

A. $EtO^{\ominus}$ is a stronger nucleophile than $\overset{\ominus}{O}H$.

B. $MeO^{\ominus}$ is a stronger nucleophile than $\overset{\ominus}{O}H$

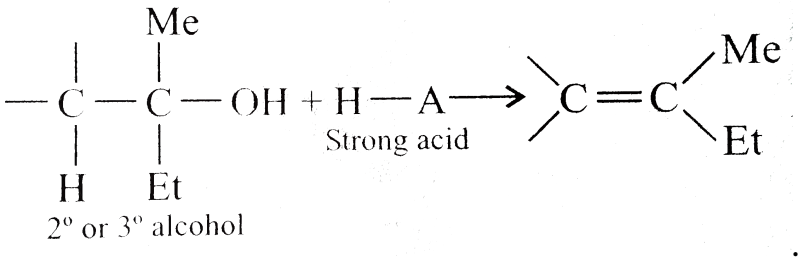
C. $RCOO^{\ominus}$ is a stronger nucleophile than ROH.

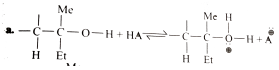
D. $MeO^{\ominus}$ is a weaker nucleophile than $\overset{\ominus}{O}H$.

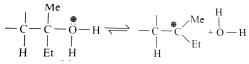
Answer: A::C::D

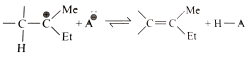
Watch Video Solution

15. Which of the following is//are the rate determining step (s) of the given reaction ?



A. 

B. 

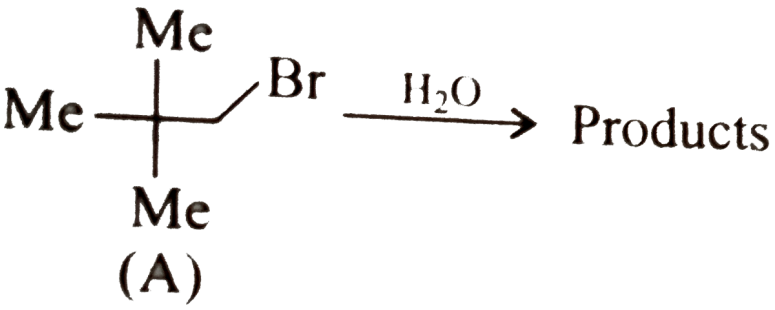
C. 

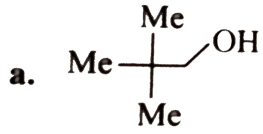
D. All

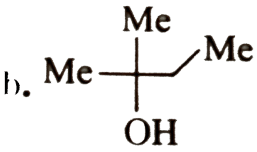
Answer: B

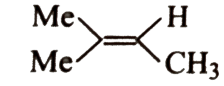
Watch Video Solution

16. The products in the given reaction are :



A. 

B. 

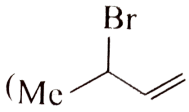
C. 

D. All

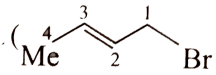
Answer: B::C

Watch Video Solution

17. Which of the following statements are correct about the addition of HBr to buta-1,3-diene ?

A. 1,2-Addition product 

, 3-bromobut-1-ene) is the major product at lower temperature $(-80^{\circ}C)$ and is a kinetic control or rate-controlled product.

B. 1,4-Addition product 

, 1-bromobut-2-ene) is the major product at high temperature $(40^{\circ}C)$ and is a thermodynamic or equilibrium-controlled product.

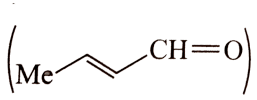
C. In a non-polar solvent (e.g., hexane), 1,2-addition product is predominantly favoured.

D. In a polar solvent (e.g., acetic acid) 1,4-addition product is predominatly favoured.

Answer: A::B::C::D

Watch Video Solution

18. Which of the following statements are correct ?

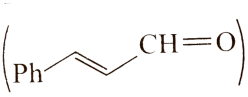


(I)

A. The nucleophilic addition of HCN to

results in major addition to $(C = O)$.

B. The nucleophilic addition of HCN to (I) results in major addition $(C = C)$

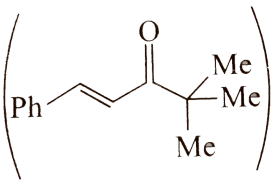


(II)

C. The nucleophilic addition of $PhMgCl$ to

results of 1,4-addition.

D. The nucleophilic addition of $PhMgCl$ to



(III) results in addition to $(C = C)$.

Answer: B::C::D

Watch Video Solution

19. In which of the following reactions, rearrangement is possible ?

A. $E1$

B. SN^1

C. $SN^{2'}$

D. $E1cB$

Answer: A::B::C

Watch Video Solution

20. Which of the following is an example of nucleophilic addition to acetaldehyde ?

A. Acetal formation

B. Cyanohydrin formation

C. Bisulphite adduct

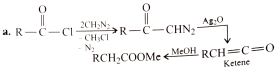
D. Wolff-Kishner reaction.

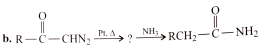
Answer: A::B::C

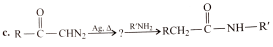
Watch Video Solution

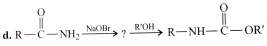
21. In which of the reactions, there is a migration of alkyl group to carbene $\left(\ddot{C}H_2\right)$, i.e., rearrangement occurs ?

A.



B. 

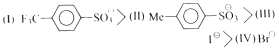
C. 

D. 

Answer: A::B::C

Watch Video Solution

22. Which of the following statements are correct ?

A. 

B. $RS^{\ominus}$ is less basic but a stronger nucleophile than $RO^{\ominus}$.

C. NH_3 is both a stronger base and a stronger nucleophilic than H_2O

D. $RO^{\ominus}$ and $\overset{\ominus}{O}H$ are both stronger bases and stronger nucleophile than ROH and H_2O.

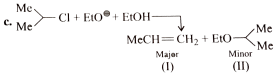
Answer: A::B::C::D

Watch Video Solution

23. Which of the following statements/reactions are correct ?

A. $SN^2 / E2$ ratio is higher with $RS^{\ominus}$ than for those with $RO^{\ominus}$.

B. $SN^2 / E2$ ratio is highest for $1^{\circ} RX$ and least for $3^{\circ} RX$.

C. 

D. $Me_3C - Br + KCN \rightarrow Me_3C - CN.$

Answer: A::B::C

Watch Video Solution

24. Which of the following statements is//are correct ?

A. Protic solvents solvate the nucleophile, lower enthalpy of nucleophiles, increase ΔG, and decrease the reaction rate of SN^2 reaction.

B. SN^1 reactions are favoured in protic solvents.

C. Crown ether increases the reactivity of nucleophile by solvating its cation.

D. SN^2 reactions are more favoured in protic solvents.

Answer: A::B::C

Watch Video Solution

25. Consider the following reactions :

$$(I) Me - \underset{(A)}{\equiv} - Me \xrightarrow[Pd+BaSO_4]{H_2+} \underset{(B)}{?} \xrightarrow{D_2/Pd/C} (C)$$

$$(II) Me - \underset{(A)}{\equiv} - Me \xrightarrow[+EtOH]{Na+Liq.NH_3} \underset{(D)}{?} \xrightarrow{D_2/Pt/C} (E)$$

Which of the following statements are correct ?

A. (B) is cis-but-2-ene and (D) is trans-but-2-ene.

B. (B) is trans-but-2-ene and (D) is cis-but-2-ene.

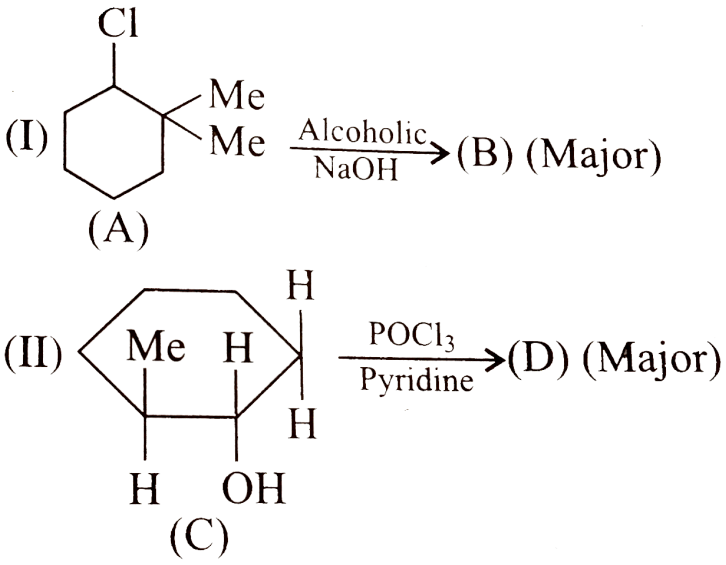
C. (c) is meso form and (E) is racemic form.

D. (C) is racemic form and (E) is meso form.

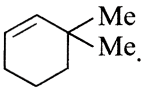
Answer: A::C

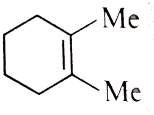
Watch Video Solution

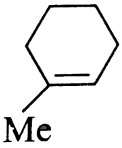
26. Consider the following reactions :

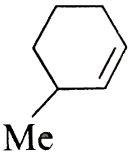


Which of the following statements are correct ?

A. **a.** (B) is 

B. **b.** (B) is 

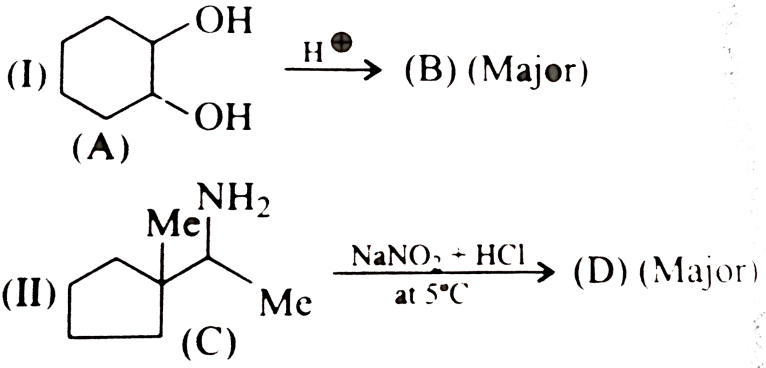
C. **c.** (D) is 

D. **d.** (D) is 

Answer: B::D

Watch Video Solution

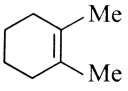
27. Consider the following reactions :

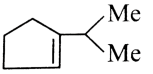


Which of the following statements are correct ?

A. **a.** (B) is  .

B. **b.** (B) is  CH=O.

C. **c.** (D) is 

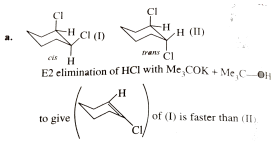
D. **d.** (D) is 

Answer: B::C

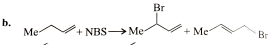
Watch Video Solution

28. Which of the following statements/reactions are correct ?

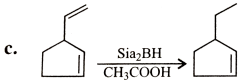
A.



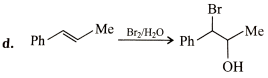
B.



C.



D.

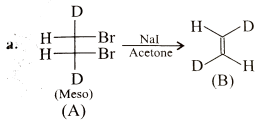


Answer: A::B::C

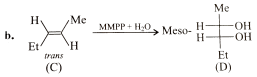
Watch Video Solution

29. Which of the following statements/reactions are correct ?

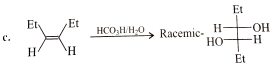
A.



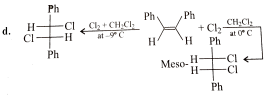
B.



C.



D.



Answer: A::C::D

Watch Video Solution

30. Which of the following reactions are both stereospecific and regioselective ?

A. cis-But-2-ene + $D_2 \xrightarrow{Pt}$

B. cis-But-2-ene + $OsO_4 + NaHSO_3 \rightarrow$

C. cis-But-2-ene + $Br_2 \rightarrow$

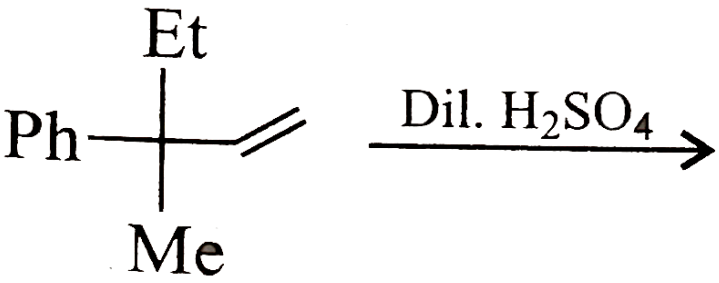
D. trans-But-2-ene + $PhCO_3H \,/\, H_2O \rightarrow$.

Answer: A::B::C

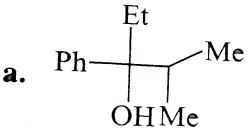
Watch Video Solution

Single Correct

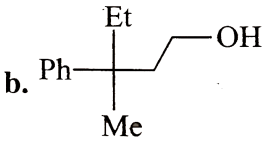
1. The major product in the reaction is :

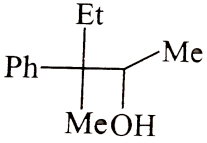


A.



B.



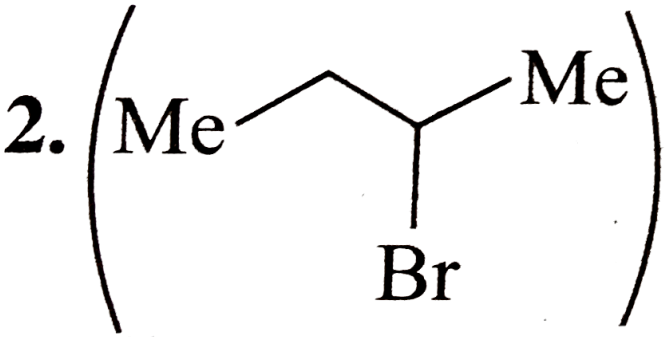
c. 

C.

D. Both (b) and (c)

Answer: A

Watch Video Solution

2. 

2. (sec-Butyl bromide) undergoes alkaline hydrolysis by :

A. SN^1

B. SN^2

C. Both (a) and (b)

D. None

Answer: A

Watch Video Solution

3. Which of the following is the strongest nucleophile ?

A. $EtO^{\ominus}$

B. OH^{-}

C. CN^{-}

D. I^{-}

Answer: A

Watch Video Solution

4. Rearrangement reactions are shown by :

A. Carbanion

B. Free radical

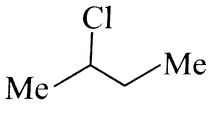
C. Carbene

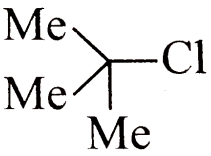
D. Carbocation

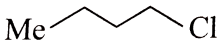
Answer: D

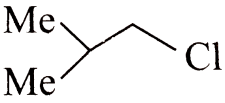
Watch Video Solution

5. Equal amount of an $RCl(C_4H_9Cl)$ is reacted at the same temperature with equal volume of $0.2M$ and $0.4M$ solution of KOH, respectively, in two separate experiments. The time taken for the reaction of $50\,\%$ of (C_4H_9Cl) was found to be same, the alkyl halide is :

A. a. 

B. b. 

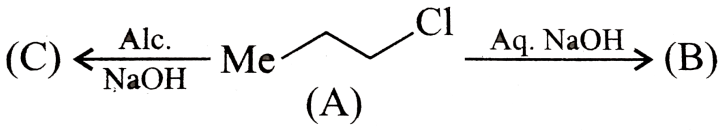
C. c. 

D. d. 

Answer: B

Watch Video Solution

6. Which of the following statements is correct about the following reactions ?



A. (B) is obtained by elimination reaction.

B. (c) is obtained by substitution reaction.

C. The molecular formula of (B) is C_3H_6 and that of (c) is C_3H_8O

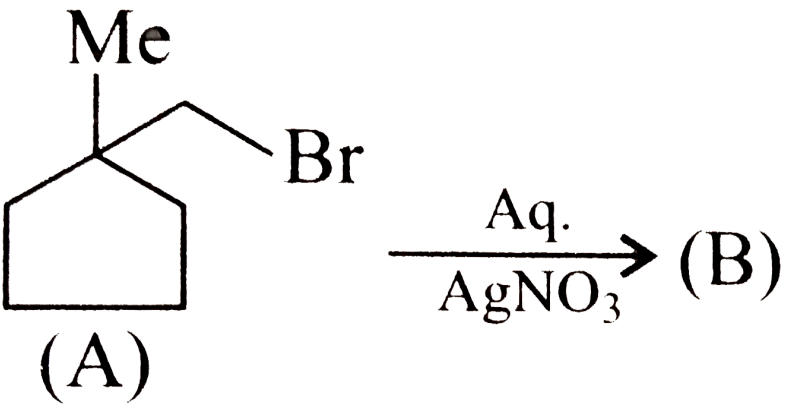
.

D. (B) is an isomer of ethyl methyl ether, while (c) is the dehydrated compound of (B).

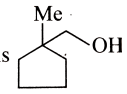
Answer: D

Watch Video Solution

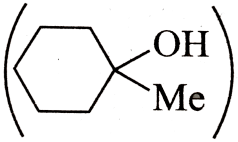
7.



Which statement is correct about the above reaction ?

a. Product (B) is 

A. (I) by SN^1 mechanism.



B. Product (B) is (II) by SN^2 mechanism.

C. Product (B) is (I) by SN^2 mechanism.

D. product (B) is (II) by SN^1 mechanism.

Answer: D

Watch Video Solution

8. In SN^2, solvolysis RX in which the solvent is a nucleophile, what is the order and molecularity of the reaction ?

A. First order , unimolecular

B. First order , bimolecular

C. Second order , bimolecular

D. Pseudo first-order , bimolecular

Answer: D

Watch Video Solution

9. A partially racemised $(+)-$ 2-bromo-octane $(2^{\circ} RX)$ on reaction with aq. $NaOH$ in acetone gives an alcohol with 80% inversion and 20% racemisation. What is the percentage of back-side attack ?

A. 0.4

B. 0.1

C. 0.9

D. 0.8

Answer: C

Watch Video Solution

10. Refer to Q.No. 9 above and find out the percentage of front-side attack.

A. 0.1

B. 0.2

C. 0.4

D. 0.8

Answer: A

Watch Video Solution

11. Refer to Q.No. 9 above and find out the rate expression of the reaction.

A. Rate $= K_1[2^\circ RX]\left[\overset{\ominus}{O}H\right]$

B. Rate $= K_2[2^\circ RX]$

C. Rate $= K_1[2^\circ RX]\left[\overset{\ominus}{OH}\right] + K_2[2^\circ RX]$

D. Rate $= K_1[2^\circ RX]\left[\overset{\ominus}{OH}\right] + K_2[2^\circ RX]$

Answer: C

Watch Video Solution

12. Refer to Q.No. 9 above and find out under what condition the reaction would follow SN^1 mechanism.

A. Low concentration of $\overset{\ominus}{OH}$

B. High concentration of $\overset{\ominus}{OH}$

C. Low concentration of $2^\circ RX$

D. High concentration of $2^\circ RX$.

Answer: A

Watch Video Solution

13. Refer to Q.No. 9 above and find out under what condition the reaction would follow SN^2 mechanism.

A. Low concentration of $\overset{\ominus}{OH}$

B. High concentration of $\overset{\ominus}{OH}$

C. Low concentration of $2^\circ RX$

D. High concentration of $2^\circ RX$.

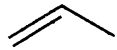
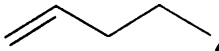
Answer: B

Watch Video Solution

14. Which of the compound in each of the following pairs will react faster in SN^2 reaction with $\overset{\ominus}{OH}$

(A) $MeBr(I)$ and $MeI(II)$

(B) $Me_3C - Cl(III)$ and $MeCl(IV)$

(C)  Br (V) and  Cl (VI)

A. $\overset{(A)}{(I)}\ \overset{(B)}{(III)}\ \overset{(C)}{(V)}$

B. $\overset{(A)}{(I)}\ \overset{(B)}{(IV)}\ \overset{(C)}{(V)}$

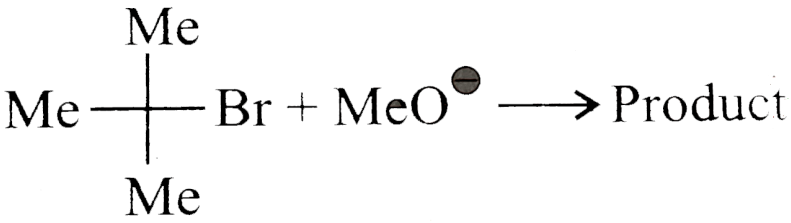
C. $\overset{(A)}{(II)}\ \overset{(B)}{(III)}\ \overset{(C)}{(VI)}$

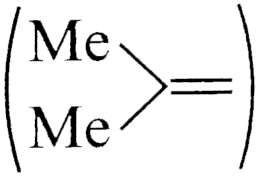
D. $\overset{(A)}{(II)}\ \overset{(B)}{(IV)}\ \overset{(C)}{(VI)}$

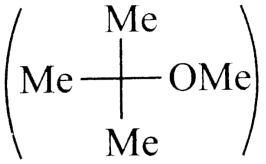
Answer: D

Watch Video Solution

15. Which statement is correct about the following reactions ?



A. Product is  by elimination reaction.

B. Product is  by substitution reaction.

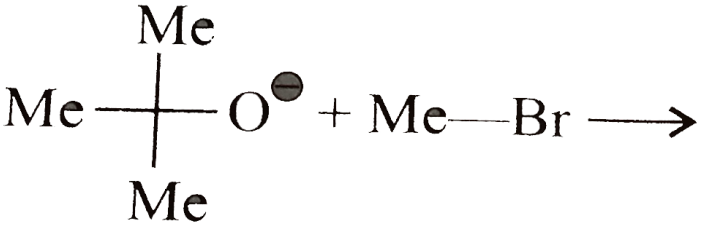
C. Both (a) and (b)

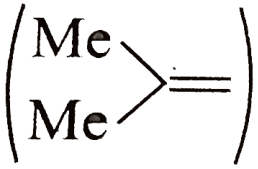
D. None

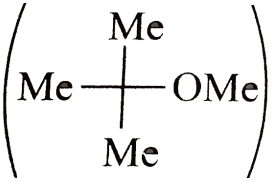
Answer: A

Watch Video Solution

16. Which statement is correct about the following reactions ?



A. Product is  by elimination reaction.

B. Product is  (II) by SN^1 reaction.

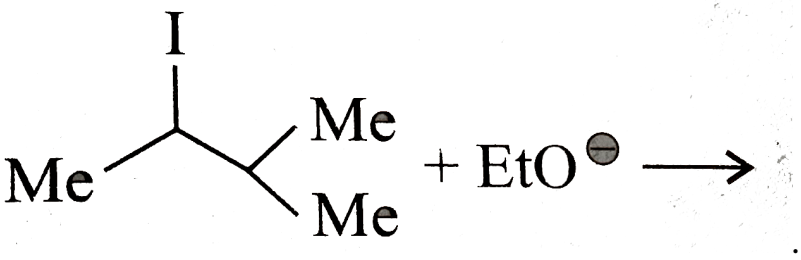
C. Product is (II) by SN^1 reaction

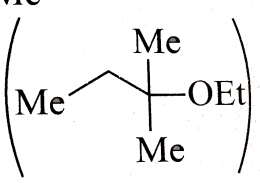
D. Both (a) and (b).

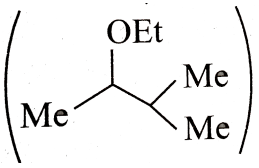
Answer: B

Watch Video Solution

17. Which statement is correct about the following reactions ?



A. Major product is 

(I) and minor product is 

(II) by SN^1 mechanism.

B. Major product is (I) and minor product is (II) by SN^2 mechanism.

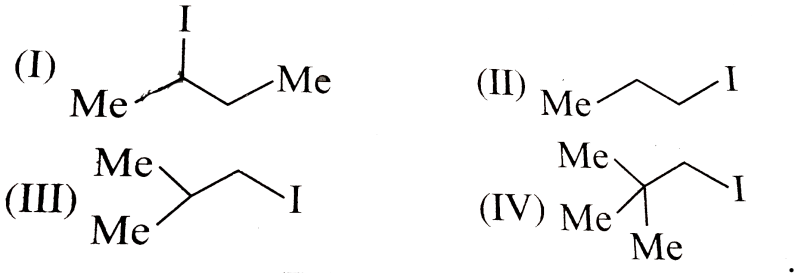
C. Major product is (II) and minor product is (I) by SN^1 mechanism.

D. Major product is (II) and minor product is (I) by SN^2 mechanism.

Answer: A

Watch Video Solution

18. The decreasing order of dehydrohalogenation of the following compounds is :



A. $(I) > (II) > (III) > (IV)$

B. $(IV) > (III) > (I) > (II)$

C. $(II) > (I) > (III) > (IV)$

D. $(IV) > (III) > (II) > (I)$

Answer: B

Watch Video Solution

19. The decreasing order of nucleophilicities of the following is :

(I) $Br^{\ominus}$

(II) $MeO^{\ominus}$

(III) $Me_2N^{\ominus}$

(IV) $Me_3C^{\ominus}$.

A. $(I) > (II) > (III) > (IV)$

B. $(IV) > (III) > (II) > (I)$

C. $(IV) > (III) > (I) > (II)$

D. $(II) > (I) > (III) > (IV)$

Answer: B

Watch Video Solution

20. The decreasing order of nucleophilicities of the following is :

(I) H_2O

(II) $EtOH$

(III) $MeCOO^{\ominus}$

(IV) $\overset{\ominus}{O}H$

(V) $EtO^{\ominus}$.

A. $(V) > (IV) > (III) > (II) > (I)$

B. $(I) > (II) > (III) > (IV) > (V)$

C. $(IV) > (V) > (III) > (II) > (I)$

D. $(I) > (II) > (III) > (V) > (IV)$

Answer: A

Watch Video Solution

21. The decreasing order of the basic character of the following is :

(I) $F^{\ominus}$

(II) $NO_3^{\ominus}$

(III) H_2O

(IV) $CH_3OH.$

A. $(II) > (I) > (IV) > (III)$

B. $(III) > (IV) > (I) > (II)$

C. $(I) > (II) > (III) > (IV)$

D. $(IV) > (III) > (II) > (I)$

Answer: C

Watch Video Solution

22. The decreasing order of nucleophilicities in $DMSO$ (dimethylsulphoxide) is :

A. $F^{\ominus} > Cl^{\ominus} > Br^{\ominus} > I^{\ominus}$

B. $I^{\ominus} > Br^{\ominus} > Cl^{\ominus} > F^{\ominus}$

C. $F^{\ominus} > Cl^{\ominus} > I^{\ominus} > Br^{\ominus}$

D. $I^{\ominus} > Br^{\ominus} > F^{\ominus} > Cl^{\ominus}$

Answer: A

Watch Video Solution

23. In which of the following reactions, SN^2 rate increases on changing the solvent from (95 % acetone + 5 % H_2O) to (80 % acetone + 20 % H_2O) ?

A. $Me_2 - \overset{\oplus}{P} - Me + NH_3 \rightarrow Me\overset{\oplus}{N}H_3 + Me_2P$

B. $MeI + PH_3 \rightarrow Me\overset{\oplus}{P}H_3 + I^{\ominus}$

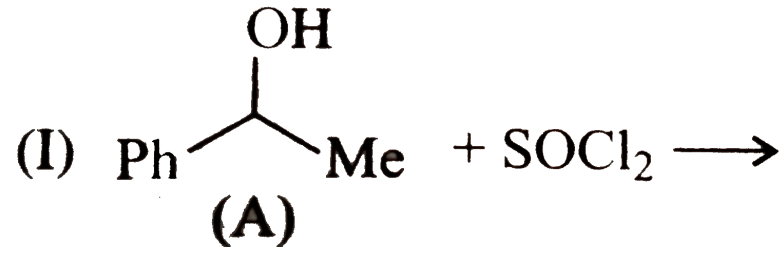
C. $MeBr + \overset{\ominus}{O}H \rightarrow MeOH + Br^{\ominus}$

D. $Me_2 - \overset{\oplus}{S} - Me + \overset{\ominus}{O}H \rightarrow MeOH + Me_2S$

Answer: B

View Text Solution

24. In which of the following reactions, retention of configuration takes place ?

(I) 

(I) .

$(II)(A) + COCl_2 \rightarrow$

$(III)(A) + SOCl_2 \xrightarrow{\text{Pyridine}}$

$(IV)(A) + COCl_2 \xrightarrow{\text{Pyridine}}$

A. $(I), (III)$

B. $(I), (II)$

C. $(III), (IV)$

D. $(I), (IV)$

Answer: B

Watch Video Solution

25. Refer to Q.No. 24 and find out in which of the reactions the inversion of configuration takes place.

A. $(I), (III)$

B. $(I), (II)$

C. $(III), (IV)$

D. $(I), (IV)$

Answer: C

Watch Video Solution

26. Refer to Q. No.24 and find out which of the reactions proceeds by SN^i mechanism.

A. $(I), (III)$

B. $(I), (II)$

C. $(III), (IV)$

D. $(I), (IV)$

Answer: B

Watch Video Solution

27. Refer to Q.No. 24 and find out which of the following reactions proceeds by SN^2 mechanism.

A. $(I), (III)$

B. $(I), (II)$

C. $(III), (IV)$

D. $(I), (IV)$

Answer: C

Watch Video Solution

28. Necessary conditions for Fiels-Alder reactions are :

A. $(I), (II), (III)$

B. $(I), (II), (IV)$

C. $(II), (III)$

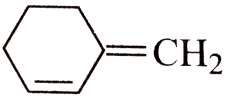
D. $(II), (IV)$

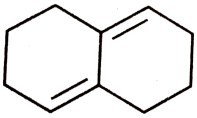
Answer: A

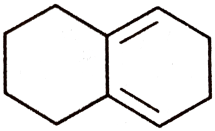
View Text Solution

29. Which of the following compounds would undergo Diels-Alder reaction with dienophile (e.g., Maleic anhydride) ?

A. $HC \equiv C - C \equiv CH$

B. **b.** 

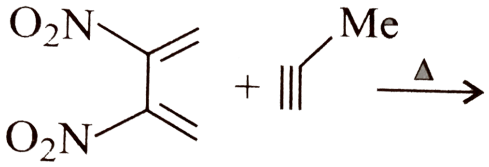
C. **c.** 

D. **d.** 

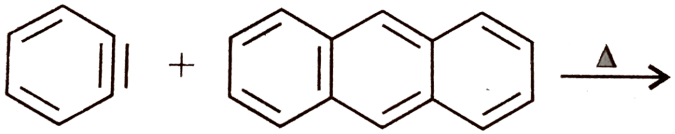
Answer: D

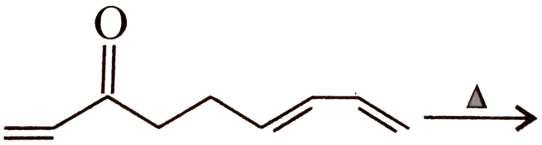
Watch Video Solution

30. Which of the following reaction would undergo Diels-Alder reaction ?

(I) 

(II) 

(III) 

(IV) 

A. All

B. $(II), (III), (IV)$

C. $(III), (IV)$

D. (II)

Answer: C

Watch Video Solution

31. The decresing order of reactivity towards SE (substitution by electrophile) of the following is :

(I) Nitrobenzene

(II) Chlorobenzene

(III) Toluene

(IV) Benzene.

A. $(I) > (II) > (III) > (IV)$

B. $(IV) > (III) > (II) > (I)$

C. $(III) > (IV) > (II) > (I)$

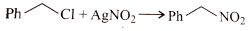
D. $(I) > (II) > (IV) > (III)$

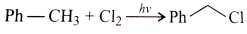
Answer: C

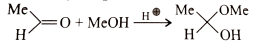
Watch Video Solution

32. Which of the following is a free radical susbtitution reaction ?

A. Benzene + $Me - Cl \xrightarrow[AlCl_3]{\text{Anhyd.}} Ph - CH_3$

B. 

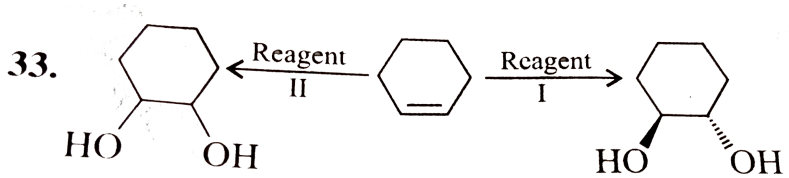
C. 

D. 

Answer: C

Watch Video Solution

33.



33.

Reagent I and II, respectively, are :

A. $OsO_4 / NaHSO_3$, $MMPP / H_2O$

B. Cold alkaline $KMnO_4$, $OsO_4 / NaHSO_3$

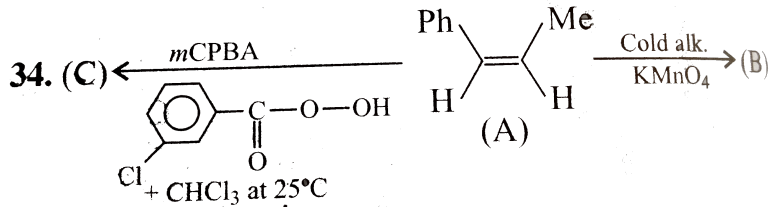
C. $PhCO_3H / H_2O$, Cold alkaline $KMnO_4$

D. $MMPP / H_2O, HCO_3H / H_2O$

Answer: C

Watch Video Solution

34.



Which product is racemic in the above reaction ?

A. Product B

B. Product C

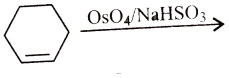
C. Both

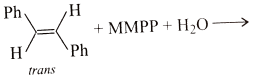
D. None

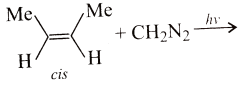
Answer: C

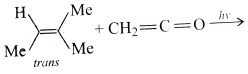
Watch Video Solution

35. Consider the following reactions.

A. a. 

B. b. 

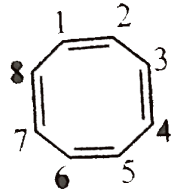
C. c. 

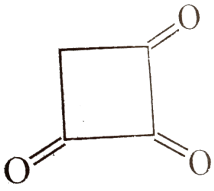
D. d. 

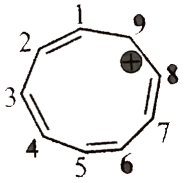
Answer: D

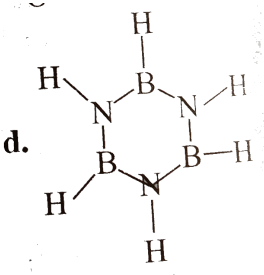
Watch Video Solution

36. Which of the following is a non-aromatic compound ?

A. a. 

B. of 

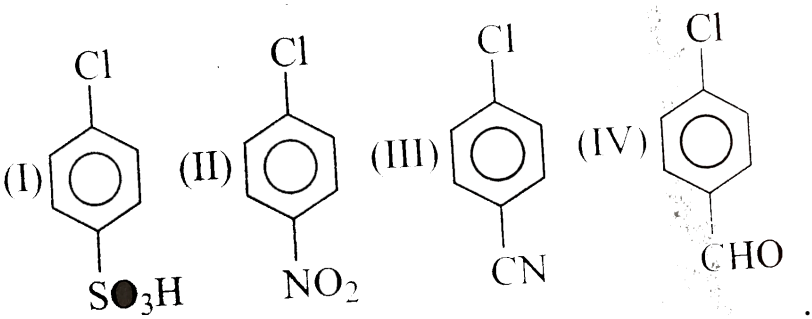
C. c. 

D. d. 

Answer: A

View Text Solution

37. The decreasing order of reactivity towards $ArSN$ reaction of the following with $NaOMe$ is :



A. $(I) > (II) > (III) > (IV)$

B. $(IV) > (III) > (II) > (I)$

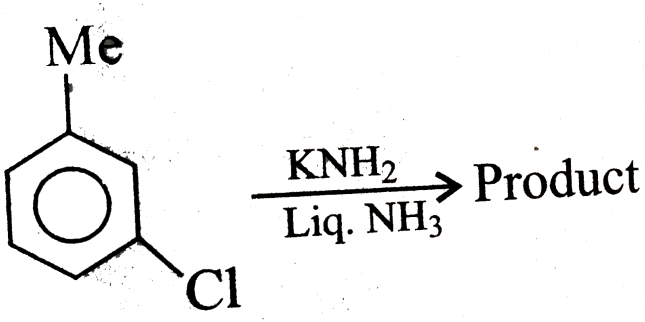
C. $(II) > (I) > (III) > (IV)$

D. $(IV) > (III) > (I) > (II)$

Answer: C

Watch Video Solution

38. Consider the following reaction :



The product is :

A. o-Toluidine

B. m-Toluidine

C. p-Toluidine

D. All

Answer: D

Watch Video Solution

39. Refer to Q.No. 38 and find out which of the following statements is wrong ?

A. The reaction is $ArSN$ (addition-elimination reaction)

B. The reaction is $ArSN$ (elimination-addition reaction) via benzyne mechanism.

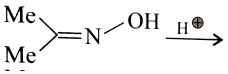
C. One product is obtained by direct substitution.

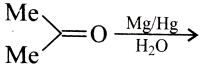
D. Two products are obtained by cine-substitution.

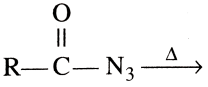
Answer: A

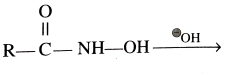
Watch Video Solution

40. Which of the following is not a rearrangement reaction ?

A. **a.** 

B. **b.** 

C. c. 

D. d. 

Answer: B

Watch Video Solution

41. Arrange the following in the reactions order of NA (nucleophilic addition) reaction.

(I) $MeCOMe$

(II) $PhCOMe$

(III) $PhCOPh$

(IV) $PhCH_2COMe.$

A. $(I) > (II) > (III) > (IV)$

B. $(IV) > (III) > (II) > (I)$

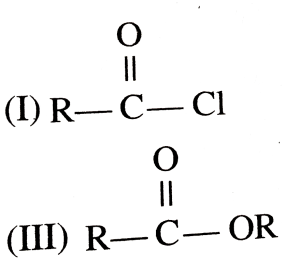
C. $(IV) > (I) > (II) > (III)$

D. $(III) > (II) > (I) > (IV)$

Answer: C

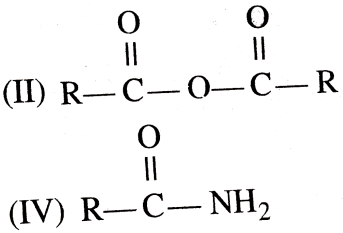
Watch Video Solution

42. Arrange the following in the decreasing order of nucleophilic acyl substitution reaction.



(I) $R-\overset{\overset{O}{\|}}{C}-Cl$

(III) $R-\overset{\overset{O}{\|}}{C}-OR$



(II) $R-\overset{\overset{O}{\|}}{C}-O-\overset{\overset{O}{\|}}{C}-R$

(IV) $R-\overset{\overset{O}{\|}}{C}-NH_2$

A. $(I) > (II) > (III) > (IV)$

B. $(IV) > (III) > (II) > (I)$

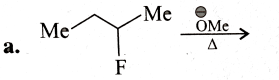
C. $(I) > (III) > (II) > (IV)$

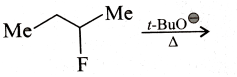
D. $(IV) > (II) > (III) > (I)$

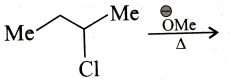
Answer: A

Watch Video Solution

43. Which of the following reactions will not give Hofmann alkene ?

A. a. 

B. b. 

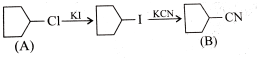
C. c. 

D. 

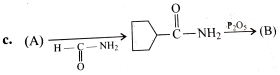
Answer: C

Watch Video Solution

44. Which of the following is the best method for the preparation of compound cyclopentyl cyanide from cyclopentyl chloride ?

A. 

B. $(A) + \overset{\Theta}{C}N \rightarrow (B)$

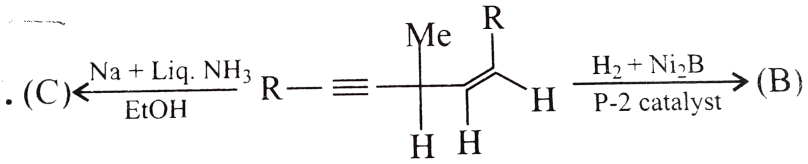
C. 

D. All

Answer: A

Watch Video Solution

45.



Which statement is correct about the above reaction ?

A. Both products (B) and (C) are optically active.

B. Both products (B) and (c) are optically inactive.

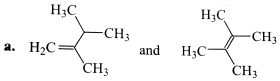
C. Product (B) is optically inactive but product (c) is optically active.

D. Product (B) is formed by anti-addition but product (c) is formed by syn-addition of H_2.

Answer: C

Watch Video Solution

46. An alkyl halide of formula $C_6H_{13}Br$ on treatment with potassium t-butoxide gives two isomeric alkenes dimethy butane. Isomeric alkene are :

A. a.  and

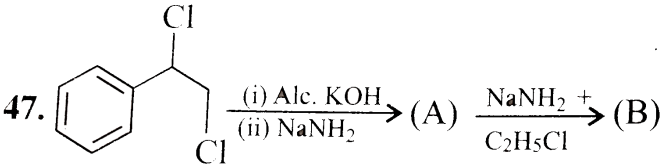
B. b. H_2C CH_3 CH_3 and H_3C CH_3

C. c. H_3C CH_3 and H_3C H_3C CH_3 CH_3

D. d. H_2C H_3C CH_3 CH_3 and H_2C CH_3 CH_3

Answer: A

Watch Video Solution

47. 

47.

(A) and (B) are :

A. a. (A)⇒ CH_2 (B)⇒ CH_3

B. b. (A)⇒ $\equiv$—H (B)⇒ Me $\equiv$—

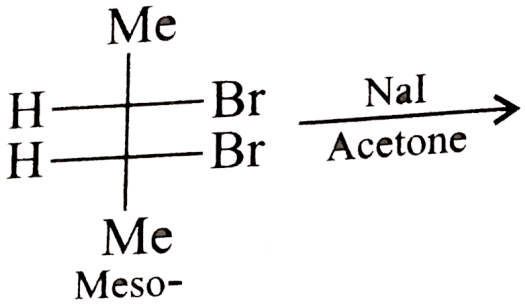
C. c. (A)⇒ $\equiv$—H (B)⇒ $\equiv$—H

D. None of these

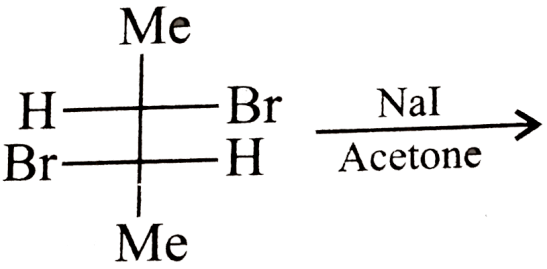
Answer: B

Watch Video Solution

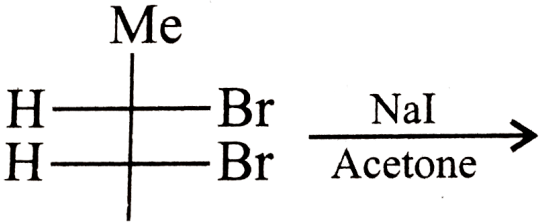
48. Which of the following reactions would give trans-alkene ?

(I)


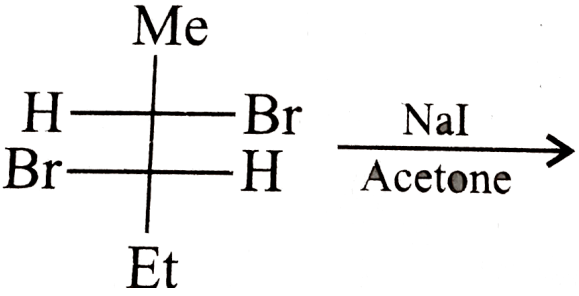
Meso-

(II)


(±) or racemate

(III)


(±) or racemate

(IV)


A. (I)

B. (II)

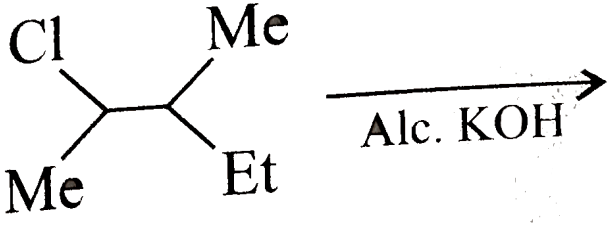
C. $(I), (III)$

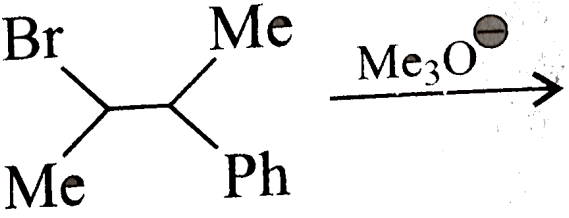
D. $(II), (IV)$

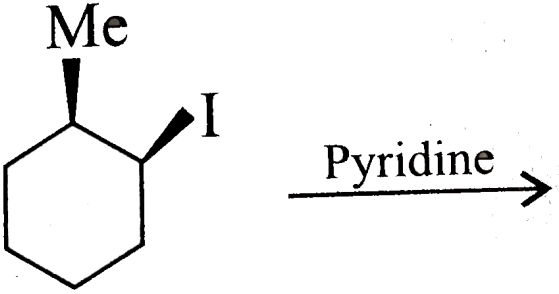
Answer: C

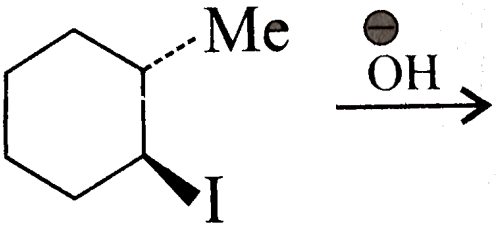
Watch Video Solution

49. Which of the following reactions is Hofmann elimination ?

(I) 

(II) 

(III) 

(IV) 

A. (I)

B. $(I), (III)$

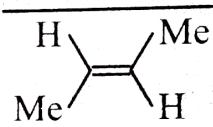
C. $(II), (III)$

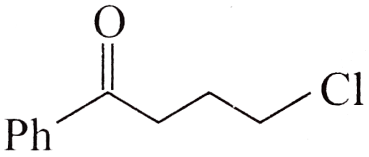
D. $(II), (IV)$

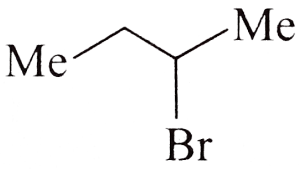
Answer: D

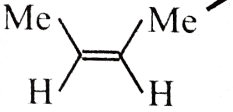
Watch Video Solution

50. In which of the following α -elimination occurs ?

(I) $Me_3CO^{\ominus} + CHClBrI \longrightarrow$ 

(II)  $\xrightarrow{\text{Alc. KOH}}$

(III)  $\xrightarrow{\text{Alc. KOH}}$

(IV) $Ph_2CHCl + \overset{\ominus}{N}H_2 \longrightarrow$ 

A. $(I), (II)$

B. $(I), (IV)$

C. $(II), (III)$

D. $(II), (IV)$

Answer: B

View Text Solution

Assertion Reasoning

1. 1° allylic halides are more reactive than $1^{\circ}\, RX$ in SN^1 reaction.

Allylic carbocation intermediate is stabilished by resonance.

A. If both (A) and (R) are true, but (R) is the correct explanation of (A)

B. If both (A) and (R) are true, but (R) is not the correct explanation of (A).

C. If (A) is true but (R) is false.

D. If (A) is false but (R) is true.

Answer: A

Watch Video Solution

2. Walden inversion takes place in SN^2 reaction.

Half-life period of SN^2 reaction is inversely proportional to the concentration of the substrate or nucleophile or both.

A. If both (A) and (R) are true, but (R) is the correct explanation of (A)

B. If both (A) and (R) are true, but (R) is not the correct explanation of (A).

C. If (A) is true but (R) is false.

D. If (A) is false but (R) is true.

Answer: B

Watch Video Solution

3. Chlorination of allylic hydrogen is difficult than vinylic hydrogen.

Allyl radical is stabilished by resonance.

A. If both (A) and (R) are true, but (R) is the correct explanation of (A)

B. If both (A) and (R) are true, but (R) is not the correct explanation of (A).

C. If (A) is true but (R) is false.

D. If (A) is false but (R) is true.

Answer: D

Watch Video Solution

4. Heavy metal ions Ag^{+} or Pb^{2+} decrease SN^{1} reactivity.

They aid ionisation of RX.

A. If both (A) and (R) are true, but (R) is the correct explanation of (A)

B. If both (A) and (R) are true, but (R) is not the correct explanation of (A).

C. If (A) is true but (R) is false.

D. If (A) is false but (R) is true.

Answer: D

Watch Video Solution

5. Crown ether acts as phase transfer catalysis and increases SN^2 reactivity.

They strongly complex cation and leave anion (nulceophile) with increased reactivity.

A. If both (A) and (R) are true, but (R) is the correct explanation of (A)

B. If both (A) and (R) are true, but (R) is not the correct explanation of (A).

C. If (A) is true but (R) is false.

D. If (A) is false but (R) is true.

Answer: A

Watch Video Solution

6. $RS^{\ominus}$ is a stronger nucleophile and a better leaving group than $RO^{\ominus}$.

$RS^{\ominus}$ is a weaker base than $RS^{\ominus}$.

A. If both (A) and (R) are true, but (R) is the correct explanation of (A)

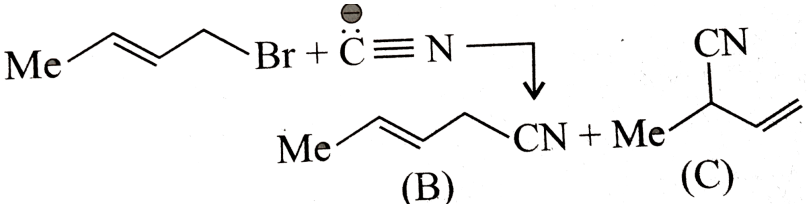
B. If both (A) and (R) are true, but (R) is not the correct explanation of (A).

C. If (A) is true but (R) is false.

D. If (A) is false but (R) is true.

Answer: A

Watch Video Solution

7. 

The product (B) results by SN^2 mechanism and product (c) results by $SN^{2'}$ mechanism.

A. If both (A) and (R) are true, but (R) is the correct explanation of (A)

B. If both (A) and (R) are true, but (R) is not the correct explanation of (A).

C. If (A) is true but (R) is false.

D. If (A) is false but (R) is true.

Answer: A

Watch Video Solution

8. $(I) MeI + PH_3 \xrightarrow[+40\% H_2O]{60\% \text{ acetone}} Me\overset{\oplus}{P}H_3 + I^{\Theta}$

$(II) MeI + PH_3 \xrightarrow{H_2O} Me\overset{\oplus}{P}H_3 + I^{\Theta}$

Increase in solvent polarity stablilises the $T.S.$, lowers E_{act}, and increases the rate.

A. If both (A) and (R) are true, but (R) is the correct explanation of (A)

B. If both (A) and (R) are true, but (R) is not the correct explanation of (A).

C. If (A) is true but (R) is false.

D. If (A) is false but (R) is true.

Answer: A

Watch Video Solution

9. ElcB` reaction is favoured by stabilisation of carbanion and poor leaving group.

The reaction is kinetically of the second order and unimolecular.

A. If both (A) and (R) are true, but (R) is the correct explanation of (A)

B. If both (A) and (R) are true, but (R) is not the correct explanation of (A).

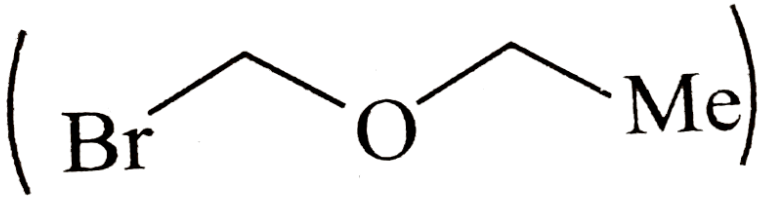
C. If (A) is true but (R) is false.

D. If (A) is false but (R) is true.

Answer: B

Watch Video Solution

10. Rate of ethanolysis of 1° halide



by SN^1 machanism is fast.

Carocation is stabilised by resonance.

A. If both (A) and (R) are true, but (R) is the correct explanation of (A)

B. If both (A) and (R) are true, but (R) is not the correct explanation of (A).

C. If (A) is true but (R) is false.

D. If (A) is false but (R) is true.

Answer: A

Watch Video Solution

11. Phenol is more reactive than benzene towards electrophilic substitution reaction.

In case of Phenol, the intermediate carbocation is more resonance stabilised.

A. Statement I is true, Statement II is true , Statement II is the correct explanation of Statement I.

B. Statement I is true , Statement II is true , Statement II is not the correct explanation of Statement I

C. Statement I is true , Statement II is false.

D. Statement I is false , Statement II is true.

Answer: A

Watch Video Solution

12. Addition of bromine to trans-2-butene yields meso-2,3-dibromobutane.

Bromine addition is an electrophilic addition.

A. Statement I is true, Statement II is true , Statement II is the correct explanation of Statement I.

B. Statement I is true , Statement II is true , Statement II is not the correct explanation of Statement I

C. Statement I is true , Statement II is false.

D. Statement I is false , Statement II is true.

Answer: B

Watch Video Solution

Archives

1. The formation of cyanohydrin from ketone is an example of :

A. Electrophilic addtion

B. Nucleophilic addtion

C. Nucleophilic substitution

D. Electrophilic substitution

Answer: B

Watch Video Solution

2. Which of the following has the highest nucleophilicity ?

A. $F^{\ominus}$

B. $\overset{\ominus}{O}H$

C. $\overset{\ominus}{C}H_3$

D. $\overset{\ominus}{N}H_2$

Answer: C

Watch Video Solution

3. As S_{N^2} reaction at an asymmetric carbon of a compound always gives:

A. An enantiomer of the substrate

B. A product with opposite optical rotation

C. A mixture of diastereomers

D. A single stereoisomer.

Answer: B

Watch Video Solution

4. Identify the correct of reactivity in electrophilic substitution reaction of the following compounds.

(1) Benzene

(2) Toluene

(3) Chlorobenzene,

(4) Nitrobenzene.

A. $(1) > (2) > (3) > (4)$

B. $(4) > (3) > (2) > (1)$

C. $(2) > (1) > (3) > (4)$

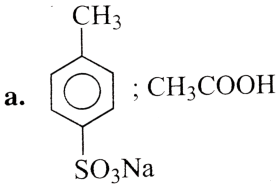
D. $(2) > (3) > (1) > (4)$

Answer: C

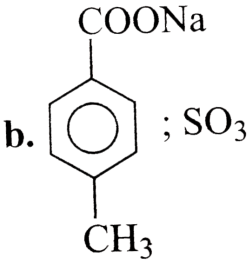
Watch Video Solution

5. 4-Methyl benzene sulphoic acid reacts with sodium acetate to give :

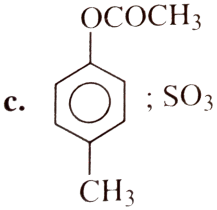
A.



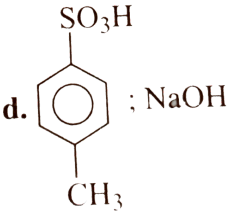
B.



C.



D.



Answer: A

Watch Video Solution

6. The number of stereoisomers obtained by bromination of trans-2-butene is :

A. 1

B. 2

C. 3

D. 4

Answer: A

Watch Video Solution

7. The order of leaving group ability is :

A. $(i) > (ii) > (iii) > (iv)$

B. $(iv) > (iii) > (i) > (ii)$

C. $(iii) > (ii) > (i) > (iv)$

D. $(ii) > (iii) > (iv) > (i)$

Answer: B

View Text Solution

8. During debromination of meso-dibromobutane, the major compound formed is :

A. n-Butane

B. 1-Butene

C. cis-2-Butane

D. trans-2-Butene

Answer: D

Watch Video Solution

True False

1. Lodide is a better nucleophile than bromide.

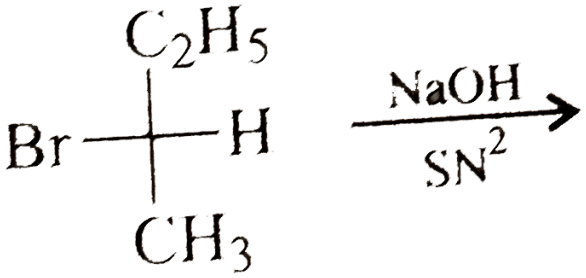
Watch Video Solution

2. During SN^1 reactions, the leaving group leaves the molecule before the incoming group is attached to the molecule.

Watch Video Solution

Analytical And Descriptive

1. Draw the stereochemical structures of the products in the following reactions.

i. 

$$R - C \equiv C - R \xrightarrow{H_2, \text{Lindlar catalyst}}$$

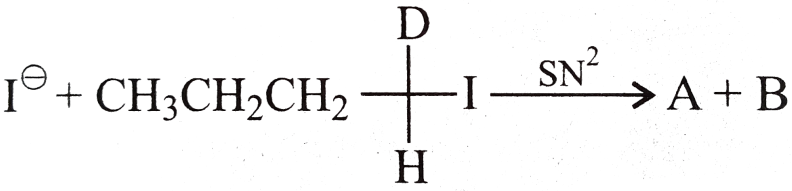
Watch Video Solution

2. Write down the structure of the stereoisomers formed when cis-2-butene is treated with bromine.

Watch Video Solution

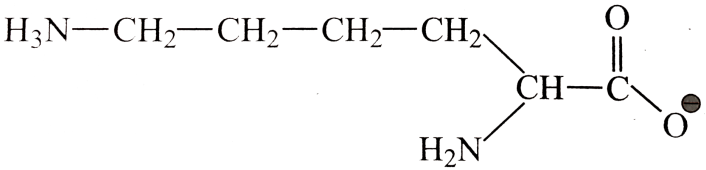
3. Optically active 2-iodo burtane on treatment with NaI in acetone gives a product which does not show optical activity. Explain briefly.

Watch Video Solution

4. 

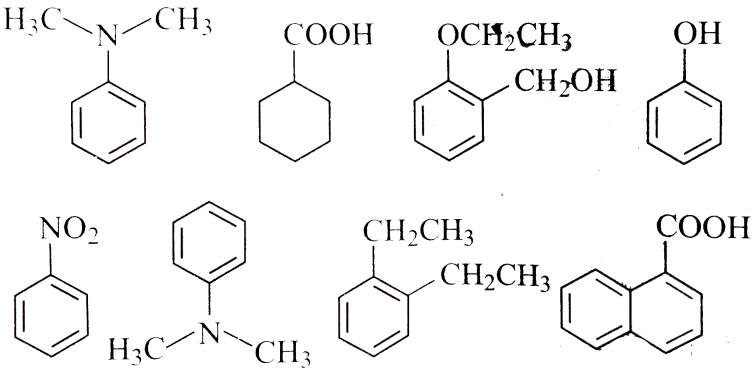
Watch Video Solution

5. The total number of basic groups in the following form of lysine is :



Watch Video Solution

6. Among the following, the total number of compound soluble in aqueous $NaOH$ is :



Watch Video Solution