CHEMISTRY

BOOKS - CENGAGE CHEMISTRY (HINGLISH)

AROMATIC COMPOUNDS AND ALKYL AND ARYL HALIDES

Illustration

1. Name of the follwing groups:

a. C_6H_5 - , b. $C_6H_5CH_2$ -

C. (C_(6)H_(5))_(2) CH-, *d*. (C_(6)H_(5))_(3) C-*e*. C_(6) H_(5) CH-, *f*. C_(6) H_(5) -

overset(|)underset(|)(C)-`

View Text Solution

2. Write the name of phenyl-substituded groups:

a. $C_6H_5\overset{|}{C}Hme$, b $C_6H_5CH_2$ -

C. $C_6H_5CH = CH$ - , d. $C_6H_5 = \ = CHCH_2$ -

View Text Solution

3. Write the sturctures of the following compounds:

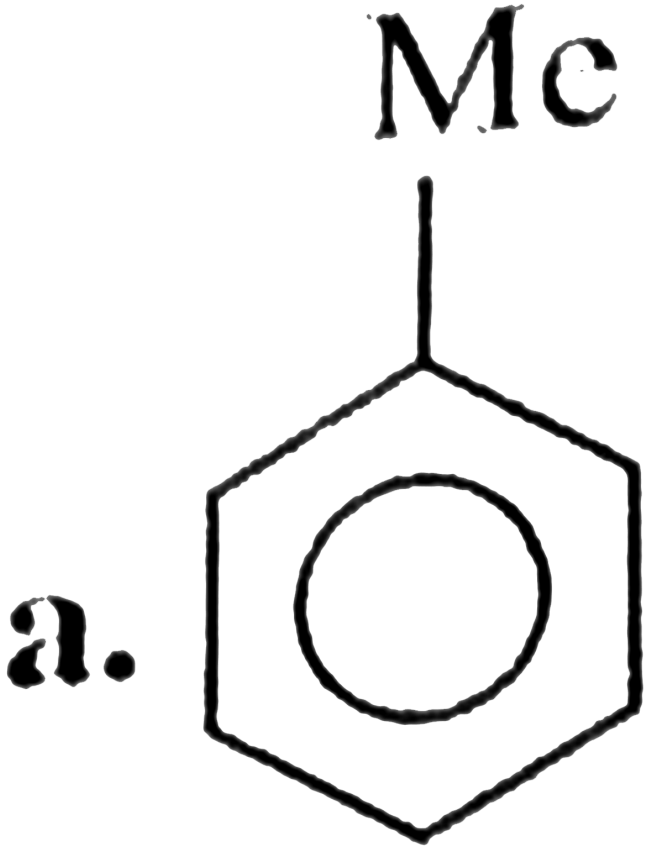
a. Adjacent tribromobenzene

b. Unsymmetrical trimethyl benzene

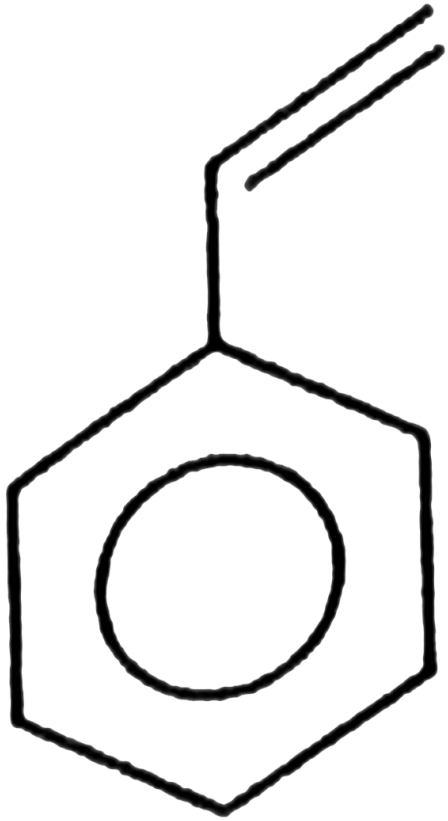
c. Symmetrical triethyl benzene

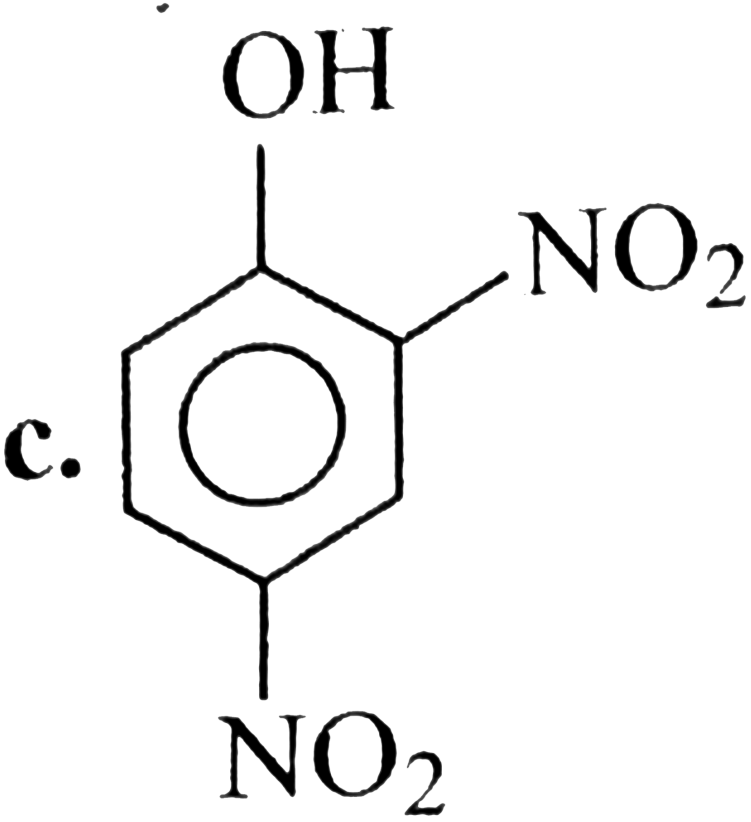
View Text Solution

4. Name of the following compounds:



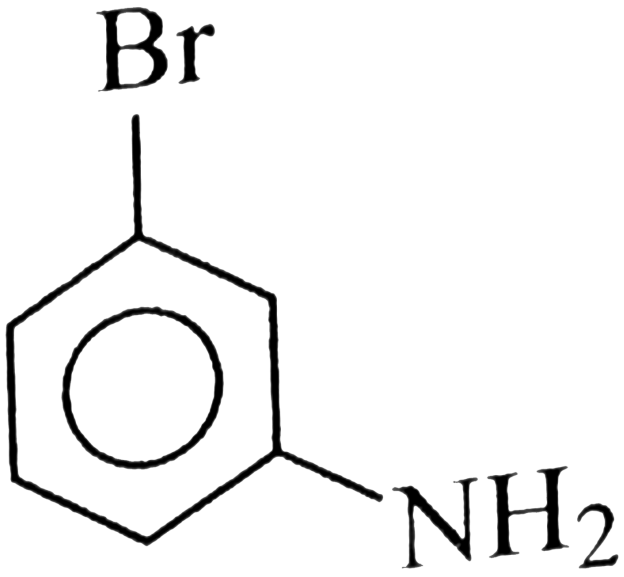
a. , b.

b. 

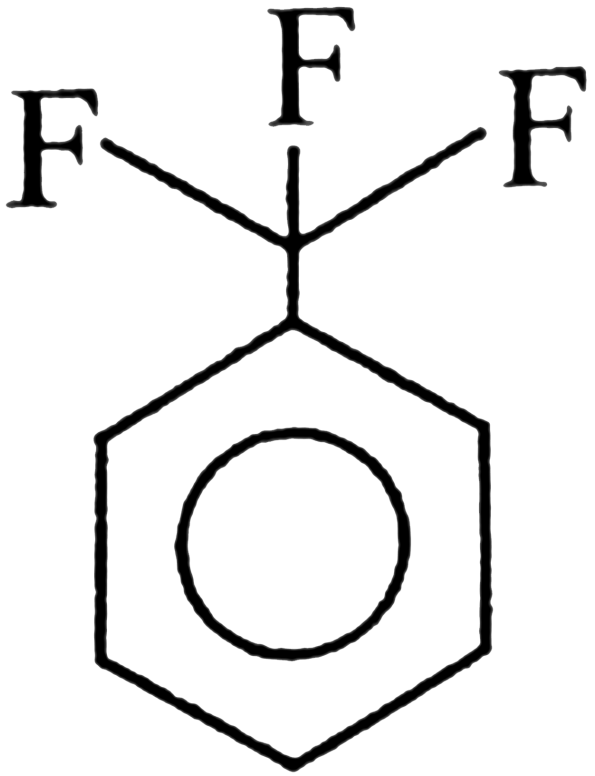
c. 

c. , d.

d.

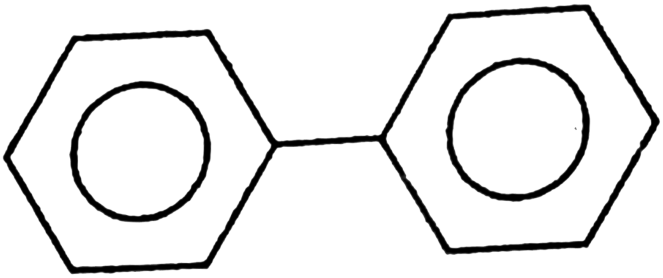


e.

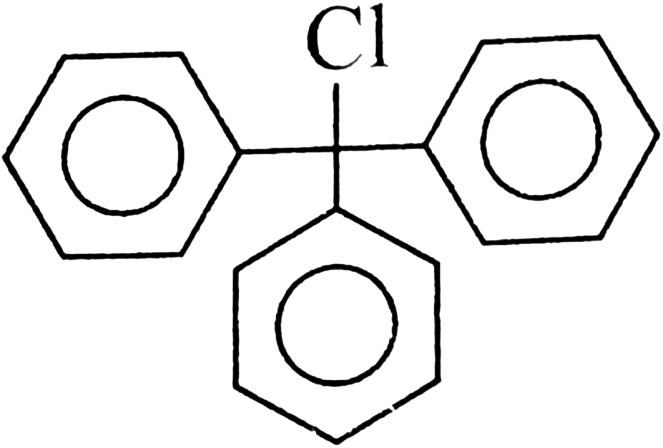


e. , f.

f.

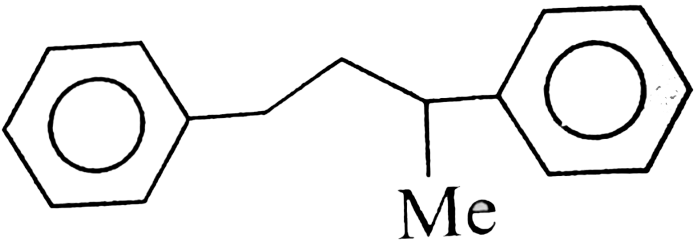


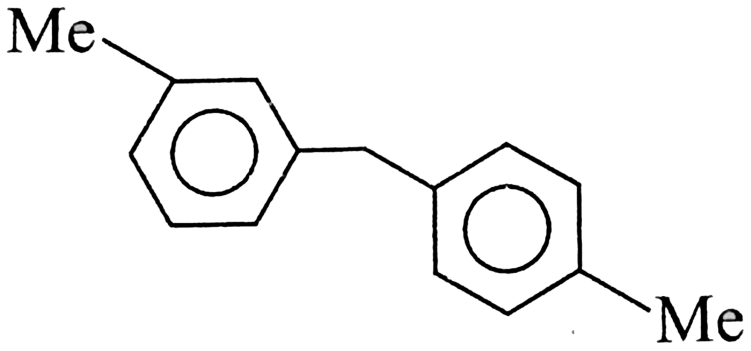
g.



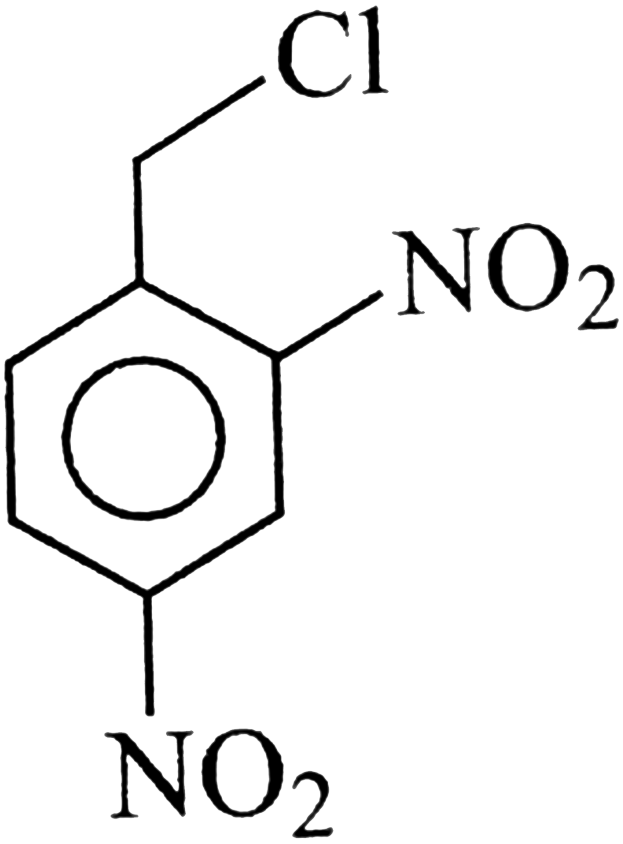
g. , h.

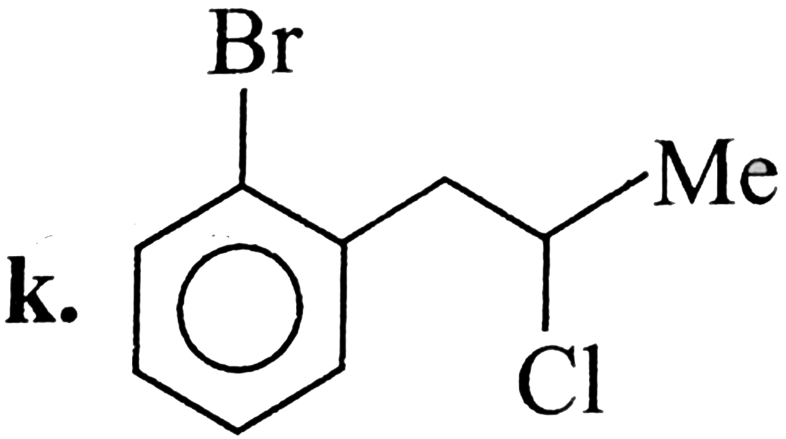
h.



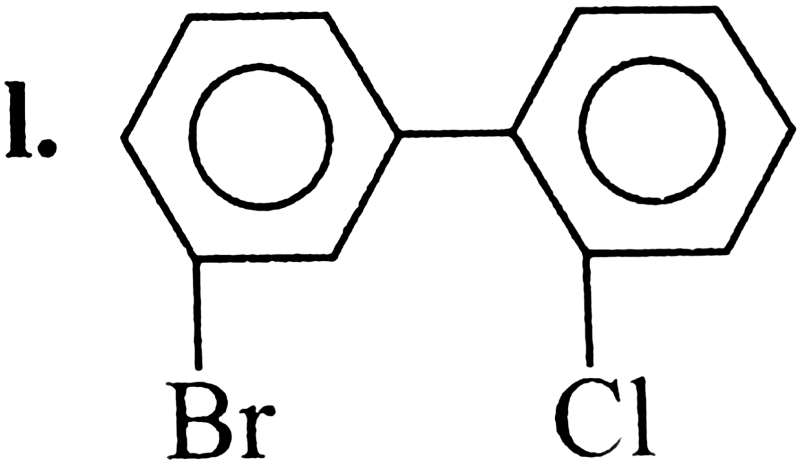


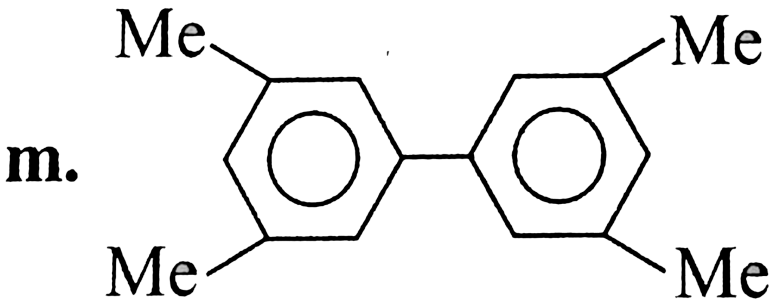
i. , j.



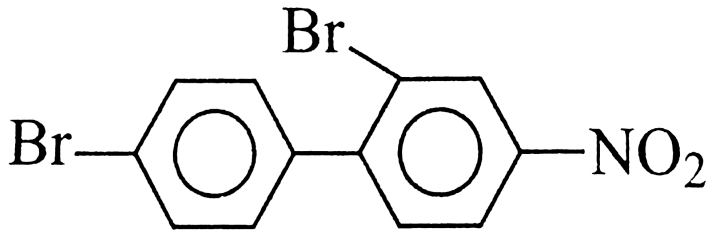


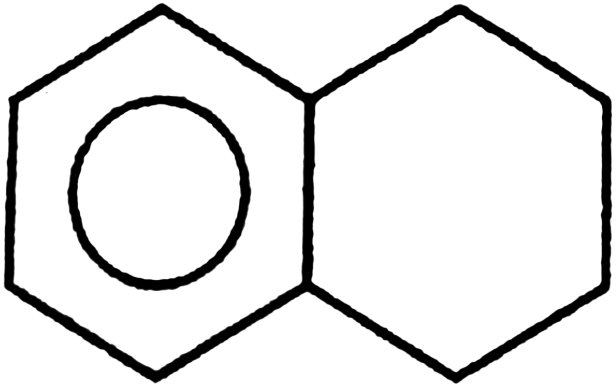
k. , l.



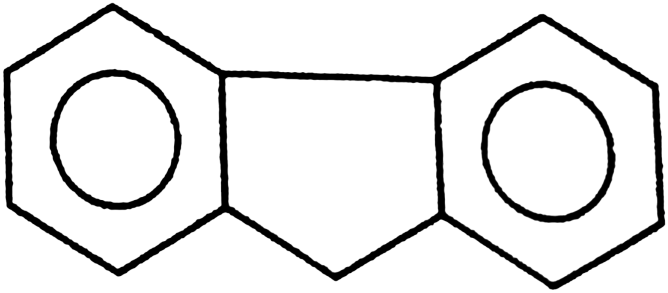


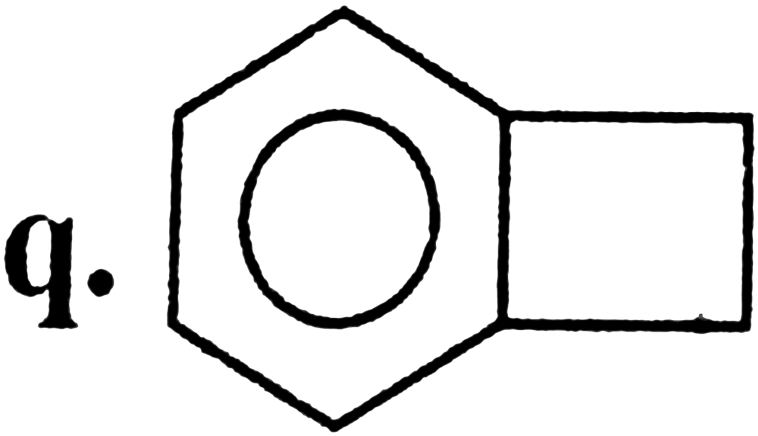
m. , n.

n. 

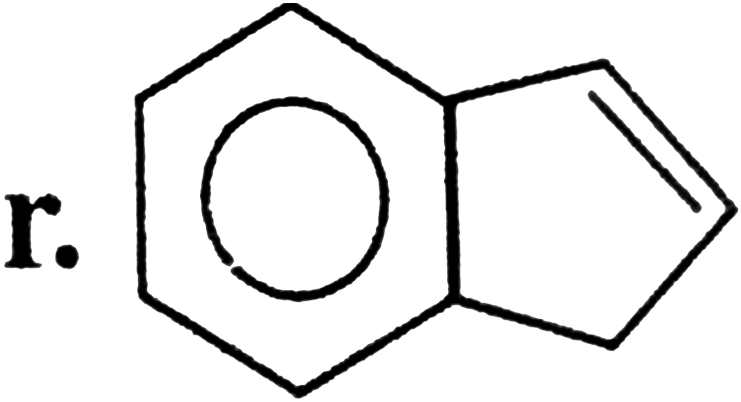
o. 

o. , p.

p. 

q. 

q. , r.

r. 

View Text Solution

5. Write the names and structures of the following compounds:

a. *TNB*, b. *TNT*

c. *PABA*, d. *DDT*

e. *DES*, f. Cumene

g. Mesitypenone, h. Acteophenone

i. Benoxopheone, j. Stryl chloride

k. Cinnamic acid, l. Cinnamylacohol

m. α - Phenylethanol, n. β - Phenlehanol

o. Benzhydryichloride

View Text Solution

6. Select the aromatic, anti-aromatic, and non-aromatic a compounds.

1. ,2. ,3.

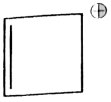
4. ,5

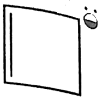
1. 

2. 

3. 

4. 

5. 

6. 

7. 

8. 

9. 

10. 

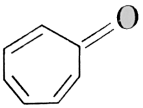
11. 

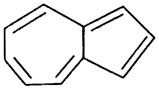
12. 

13. 

14. 

15. 

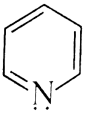
16. 

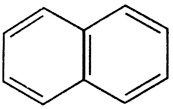
17. 

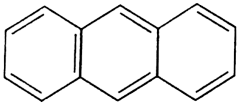
18. 

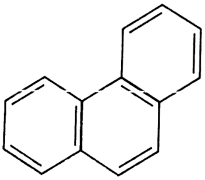
19. 

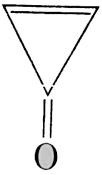
20. 

21. 

22. 

23. 

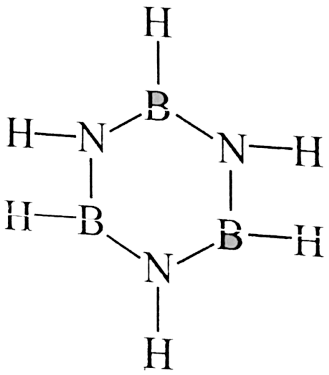
24. 

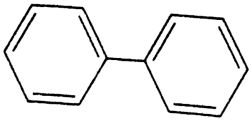
25. 

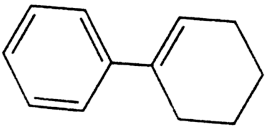
26. $\overset{\oplus}{C_9H_9}$

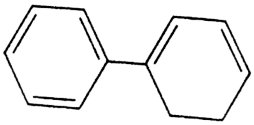
27. $\overset{\ominus}{C_9H_9}$

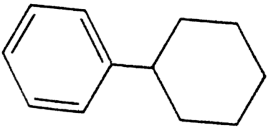
28. C_9H_{10}

29. 

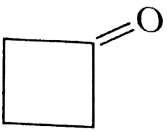
30. 

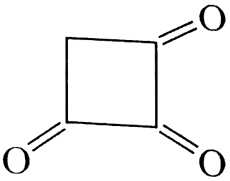
31. 

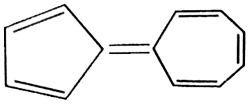
32. 

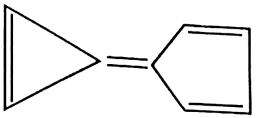
33. 

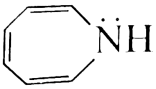
34. 

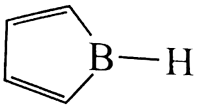
35. Tautomeric form of 

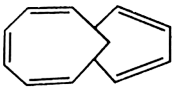
36. Tautomeric form of 

37. 

38. 

39. 

40. 

41. 

View Text Solution

7. a.

7 - Bromocycloheptraiene (tropylium bromide) completely dissociates in water and gives a yellow precipiate of $AgBr$ with $AgNO_3$. Why?

(b) Why is cyclopentadiene $\left(K_a = 10^{-15}\right)$ much more acidic than $1,3$ - cyclohexadience?

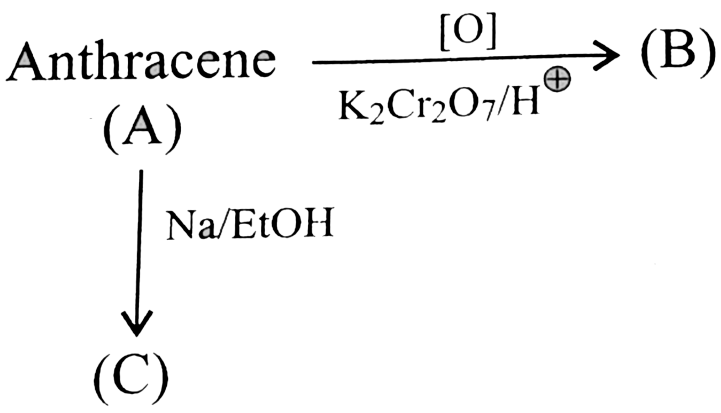
C. Explain the following $1,3,5$-cycloheptatrience through a cycle, planner triene with six $\pi\vec{e}'s$ is not armoatic, whereas tropolone behaves like a phenol.

View Text Solution

8. Anthrance has a resonance energy of $351kJmol^{-1}$ and the resonance energy of benzence is 150.5 kJ mol^(-1)`. Which of the two is more easily oxidised or reduced ?

View Text Solution

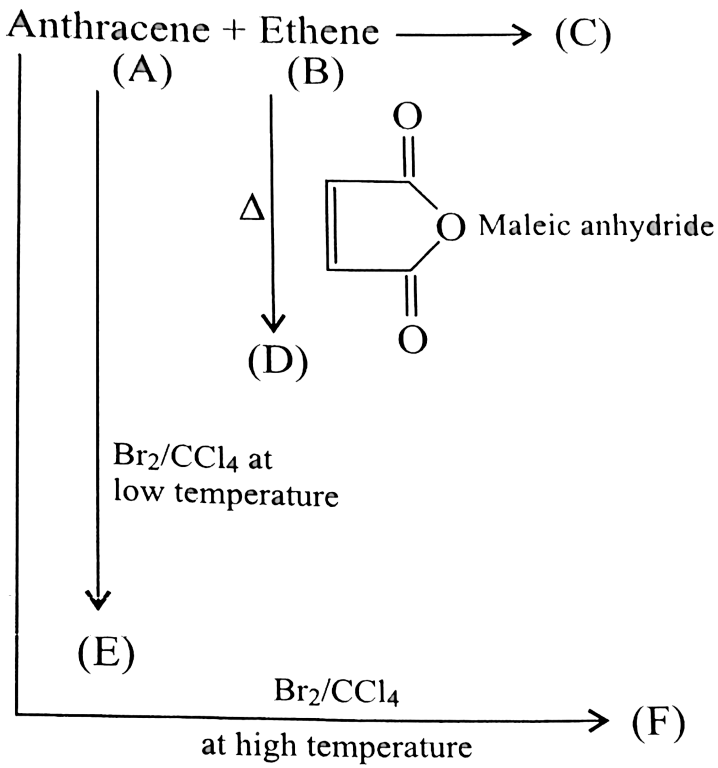
9. a. Compkere the following reaction.



b. Why do the oxidation and reduction of anthracene take place at positions 9 and 10, respectively?

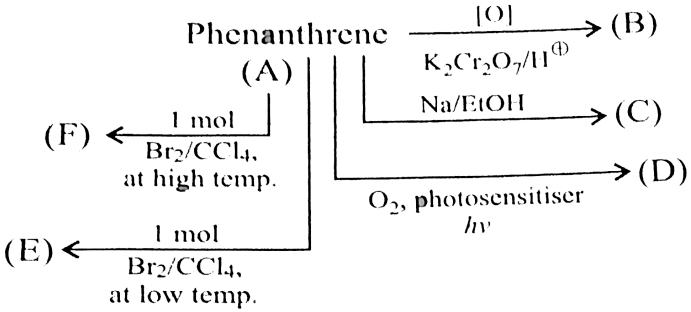
View Text Solution

10. Complete the reactions.



View Text Solution

11. Complete the reactions.

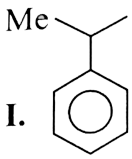
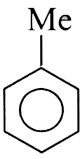


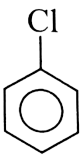
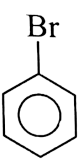
View Text Solution

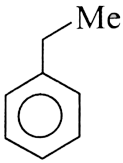
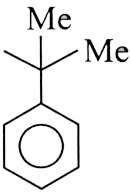
12. Out of benzene naphtahlene anthracene, and phenantrene, which is more reactive in the Diels - Alder reaction?

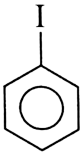
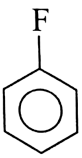
View Text Solution

13. Among the following in which cases is the o/p ratio on nitration more the first compound?

a. I.  II. 

b. I.  II. 

c. I.  II. 

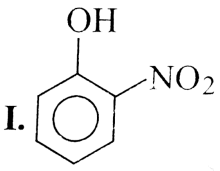
d. I.  II. 

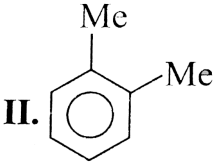
View Text Solution

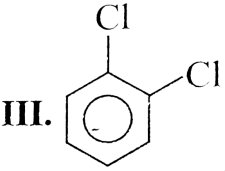
14. Why are $(o + p)$ in ratious for the *SE* reaction (e.g. nitraction) of toluene and *PhCF*, 32.3 and 0.14, respectively ?

View Text Solution

15. Arrange the following in the decreasing of μ.

I. 

II. 

III. 

Watch Video Solution

16. Write resonance-contributing structures for the intermedicate carbocation (arenonium ion) of

(i) Phenol

(ii) Nitrobenzene with electrophile $CI^{\oplus}$ at the

a. ortho-,

b. para-, and

c. meta-positions.

View Text Solution

17. a. Why are $\bar{e}$ donating groups, such as $\left(-NH_2\right)$ (- OR), $(-R)o-$ and $p-$ directing towards SE reaction? Explain by an example.

b. Why are $\bar{e}$ withdrawing groups, [such as $\left(-NO_2, \left(-SO_3H\right), (-CN), (-COOH)\right.$, etc].$m-$ direection towards SE reaction? explain by example.

c. Although halogens are $\bar{e}$ withdrawing yet they are $o-$ and $p-$ directing towards SE reaction. Why?

View Text Solution

18. Arrange the following compounds in decreasing order of their property as indicated:

a. Reactivity and orientation of (I) $Ph - \overset{\oplus}{S} .. - Et_2$ and (II) $PhNO$.

Activating effects of the following o, p - directions:

I. $-O^{o-}$. *II*, -OH, *III*. -NH_(2)*IV*. $- NHCOCH_3$ V. $-OCOCH_3$

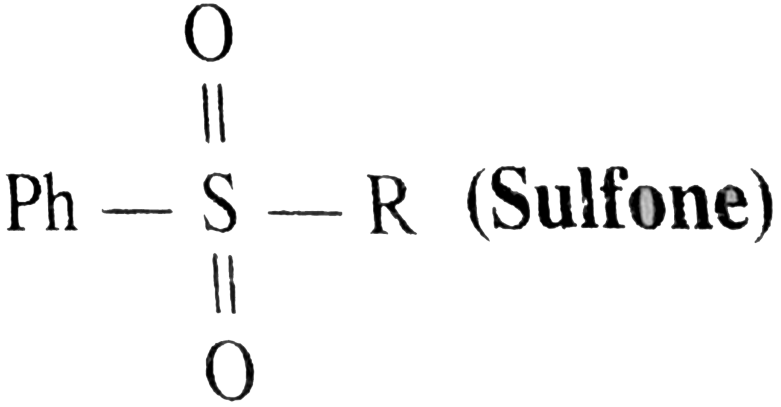
c. Respectivity and orientation of I. $PhOEt$ and II. $PhSEt$

d. Categories the following subsituents as:

I. Activating,

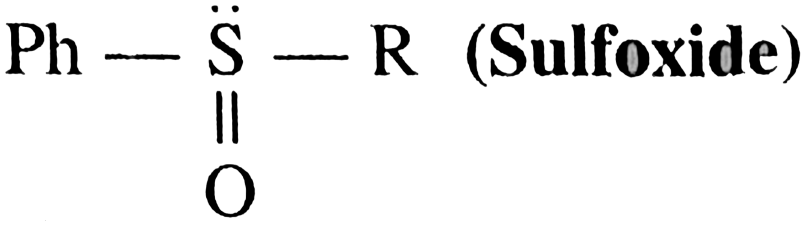
ii. Deactivating,

iii. o, p, or m - directing.



(Sulfone)

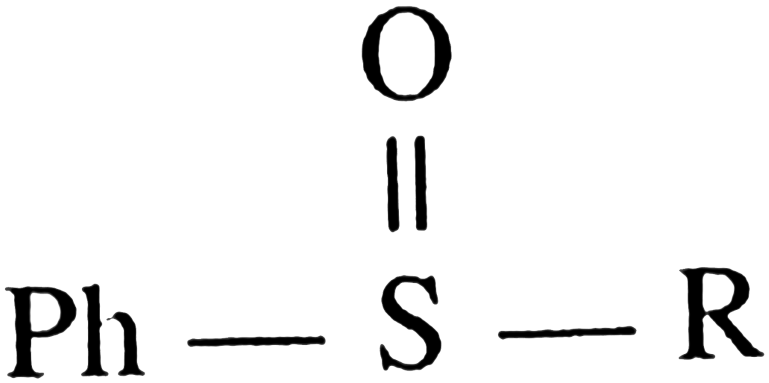
I.



II.

III. $Ph - \ddot{S} - R$

SE reactivty of:



I. *PhNO*, II.

f. *SE* reactivity and orientation of:

1. *PhF*, II. *PhCl*, III. PhBr, *IV*. Phl`

View Text Solution

19. Identify the electrophile and base for each for the following:

a. $HNO_2 + H^{\oplus}$, b. $Ibr + ZnCl_2$

c. $Icl + ZnCl_2$, d. $HOCl + H^{\oplus}$

e. HNO_3

$H_2S_2O_7$

Watch Video Solution

20. Give the decreasing order of the relative reactivity towards SE reaction of the following compounds.

a. I. Benzene, II. Phenol, III. Aniline, IV. Chlorobenzene

b. I. Acetannilide, II. Aniline, III. Acetep[jempme, IV. Benzene.

c. I. 1,3- Dimryhyl benzene, II. $1, 4$ - Dimenthyl-benzene, III. Tolune, IV. Trimehtyl benzene, V. $1, 3, 5$ - Trimethtyl benzene

d. I. p - Mehtyl benzoic acid, II. Terephtalic acid, III. p - Xylene, IV. Toluene.

e. I. Benzene, II. Toulene, III. p - Nitrotoulene, IV. m - Nitroluence, V. Benzence

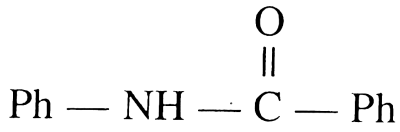
g. I. Flurobenzene, II. Chlorobenzene, III. Bromobenzene, IV. Iodobenzene

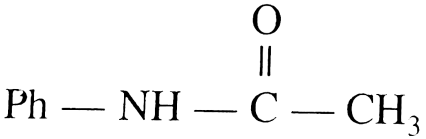
h. I. p - Nitrochlorobenze II. Chlorobenzene, III. 2.4 - Dintrochlorobenzene

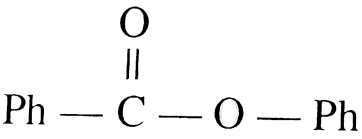
View Text Solution

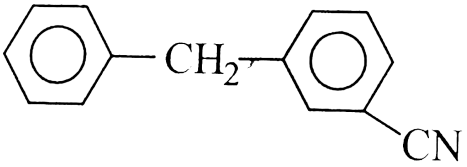
21. Indicate by an arrow the positon(s) where SE reaction takes place in the following:

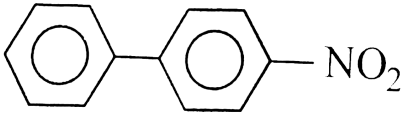
a. 

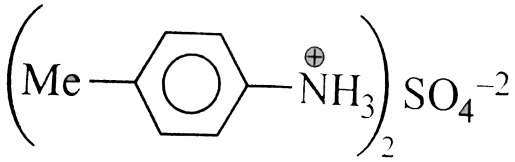
b. 

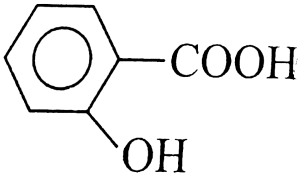
c. 

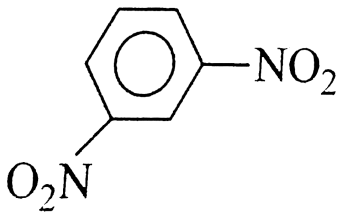
d. 

e. 

f. 

g. 

h. 

i. 

j. Ph - CF_3

k. Ph - $\overset{\oplus}{N}R_3\Big\}NO_3^{o-}$

l. o, m - and p - Ethoxyacentanilide

View Text Solution

22. Complete the following reaction:

$$o\text{ - }HOOC(A)\text{ - }C_6H_4\text{ - }CH_2\text{ - }Ph \xrightarrow{SOCl_2} (B)$$

$$\xrightarrow{\text{Anhyd } AlCl_3} (C) \xrightarrow{Zn+Hg/+HCl} (D) \xrightarrow{\text{SorSe, } 600^\circ C} (E)$$

Watch Video Solution

23. a. Which of the following shows primary isotope effectgt

i. Nitration of benzene. ii. Halogenation of CH_4. Iii. Alkene prepared by $E.\ lcB$ mechanism.

b. Which of the following shows secondary isotope effect?

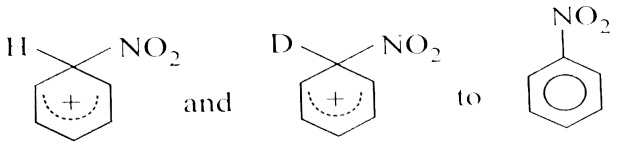
i. An alkene obtained by $E.2$ mechanism

ii. An alkene obtained by $E.l$ mechanism

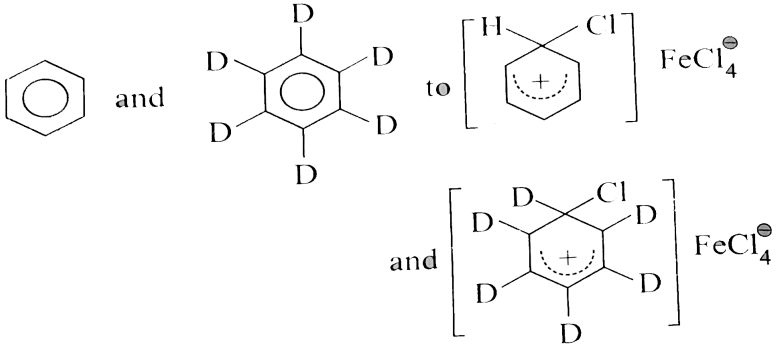
c. Which of the following examples of K_H/K_D (ratio of rate constant) is greater than 1.

i. $PhCH_2CH_2Br$ adn $PhCD_2CH_2Br$ towards de-hydrohalogenation by strong base.

ii. Conservation of:



iii. Conversion of:



iii. Conservation of:

View Text Solution

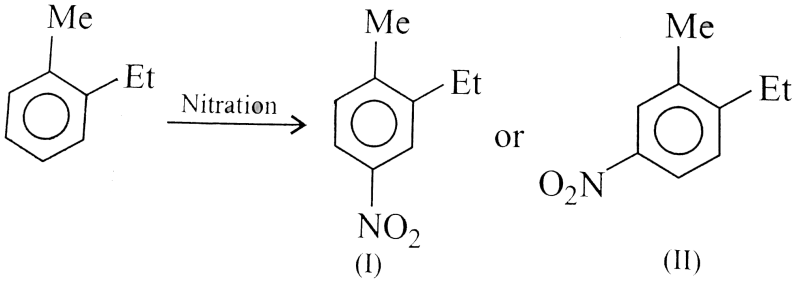
24. Convert benzene to adjacent trimethyl benzene.

View Text Solution

25. a. In the $F.C.$ Alkylation with alkene, why is HF, not HBr, used? How does HF at high temperature effect the dealkylation process?

In Illustration 11.24 in the conversion of (I) to (II), why dows alkylation take place at 2 and 6 positions rather than at 3 and 5 positions?

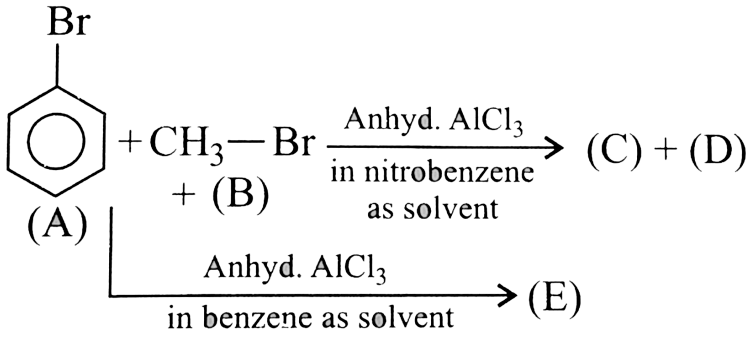
c. Expain which product (I) or (II) is formed and why.



d. What is the depreesion in freezing point of $1m$ soultion of nitrating mixture $\left(K_f = xK, kgmol^{-1}\right)$?

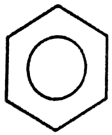
View Text Solution

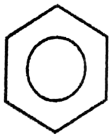
26. Complete the reaction:



View Text Solution

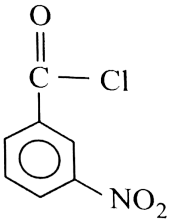
27. Complete the following reaction:

a.  + CH_3Cl (Excess) $\xrightarrow[AlCl_3]{\text{Anhyd.}}$ (A)

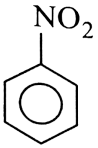
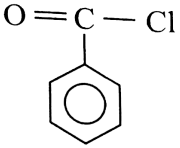
b.  + CH_2Cl_2 $\xrightarrow{AlCl_3}$ (B)

c.  + $CHCl_3$ $\xrightarrow{AlCl_3}$ (C)

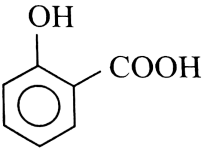
d.  + CCl_4 $\xrightarrow{AlCl_3}$ (D)

e.  +  $\xrightarrow{AlCl_3}$ (E)

m-Nitrobenzoyl chloride

f.  +  $\xrightarrow{AlCl_3}$ (F)

Benzoyl chloride

g. (H) $\xleftarrow[\text{nitro benzene as solvent}]{\text{2 mol of ICl in}}$  $\xrightarrow[\text{vapour phase}]{\text{2 mol of ICl in}}$ (G)

Salicylic acid

h.  + $Me_3C-C(=O)-Cl \xrightarrow{AlCl_3}$ (I)

View Text Solution

28. For dofferemt reactions of H_2SO_4 with (i) HNO_3 and (ii) $HClO_4$,

a. Write the equactions for the recactionsand identify the conjugate acids

and bases:

b. Expain the different behaviours of H_2SO_4

II. Nitrobenze can be prepared from benzene by using a mixture of conc. HNO_3 and conc. H_(2)SO_(4) In the nitrating mixture, HNO_3 acrs are:

a. Base, b. Acid

c. Reducing agent, d. Catayst

III. Among the following statements on the nitraction of aromatic compounds, the false one is:

a. The rate of nitration of benzene is almost the sameas that of hexadeucterobenzene.

b. The rate of nitration of touene is grater than that of benzene.

c. The rate of nitration of benzene is greater than that of hexadeuterobenze.

c. The rate of nitration of benzene is greater than that of hexadeuterobenezene.

d. Nitration is an electrophillic subsitution reaction.

IV. Select the correct alternatice(s).

The following reaction occurs in a mixture of conc. HNO_3 and cnc. H_2SO_4 as:

$HNO_3 + 2H_2SO_4 \rightarrow NO_2^{\oplus} + 2HSO_4^{\oplus} + H_3^{\oplus}$

Which of the following statements about this reaction is correctgt

a. Nitric acid acts as a base.

b. Sulphuric acid acts as a base.

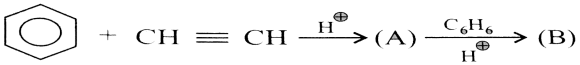
Sulphure acid acts as a dehydrating agent.

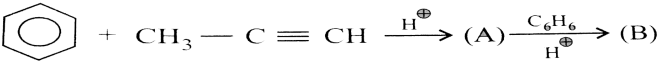
d. Addition of H_2O will reduce the $NO_2^{\oplus}$ concentration.

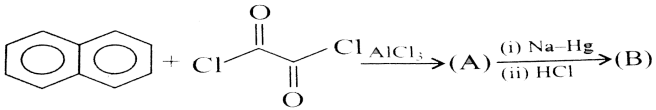
e. HNO_3 and $NO_2^{\oplus}$ are conjugate acid-base pair.

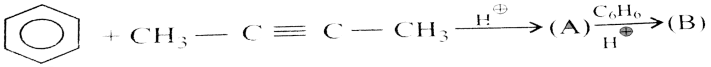
View Text Solution

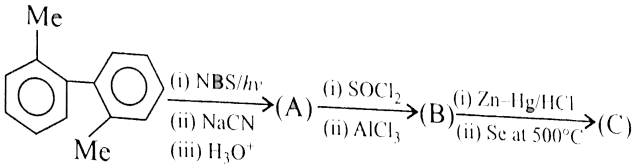
29. Complete the following reaction:

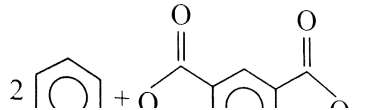
i. 

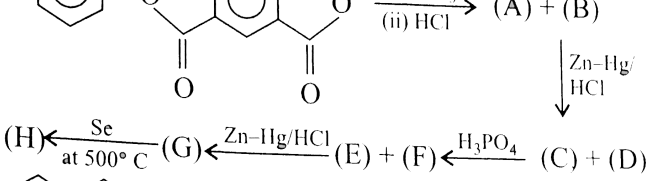
ii. 

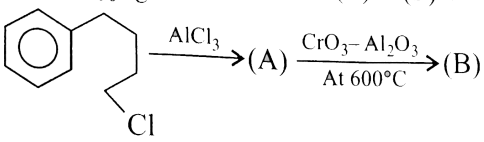
iii. 

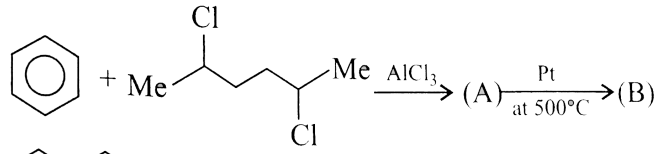
iv. 

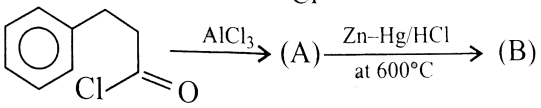
v. 

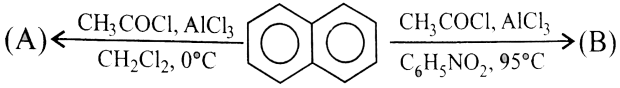
vi. 

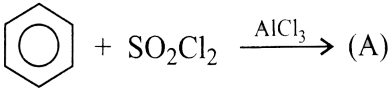


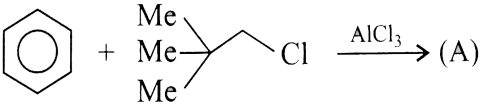
vii. 

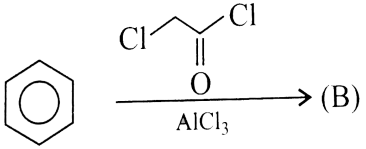
viii. 

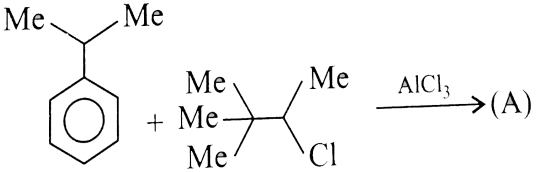
ix. 

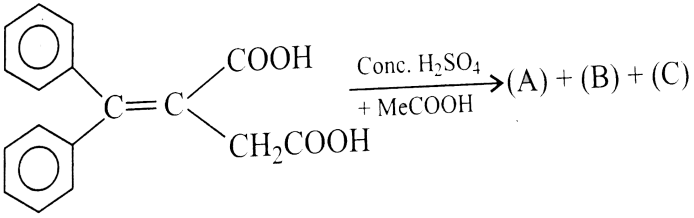
x. 

xi. 

xii. a. 

b. 

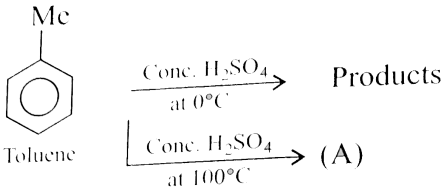
c. 

xiii. 

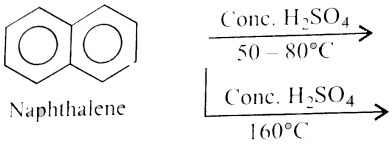
View Text Solution

30. Complete the following reactions:

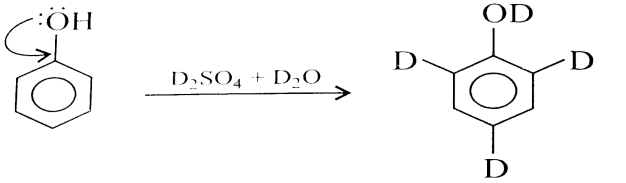
a.



b.

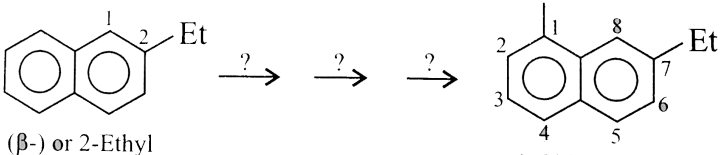


c.



(2,4,6-Trideutero deutero phenol) or (2,4,6-Tri-d-d-phenol)

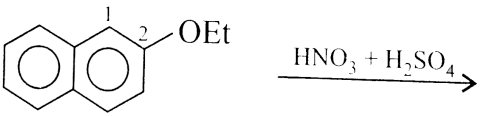
d.



(β-) or 2-Ethyl naphthalene

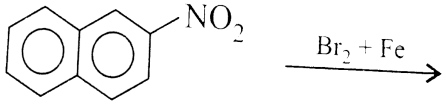
1-Chloro-7-ethyl naphthalene

e.



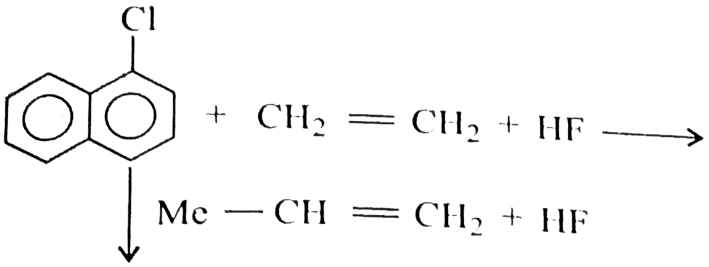
(β-) or 2-Ethoxy naphthalene

f.



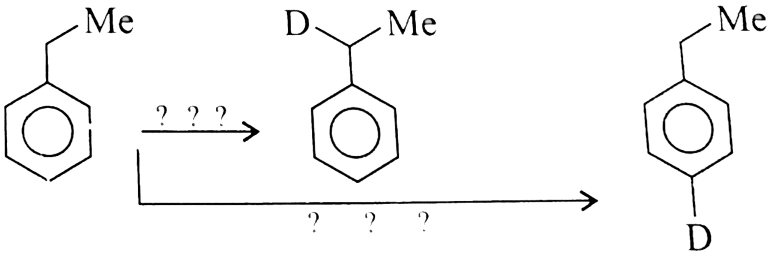
(β-) or 2-Nitro

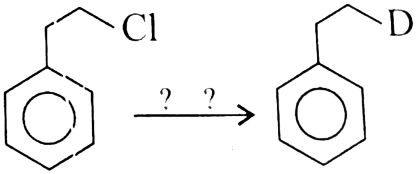
naphthalene

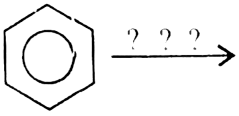
g. 

View Text Solution

31. Convert the following:

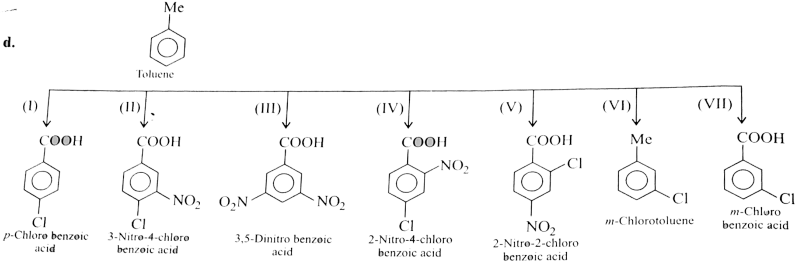
a. 

b. 

c. 

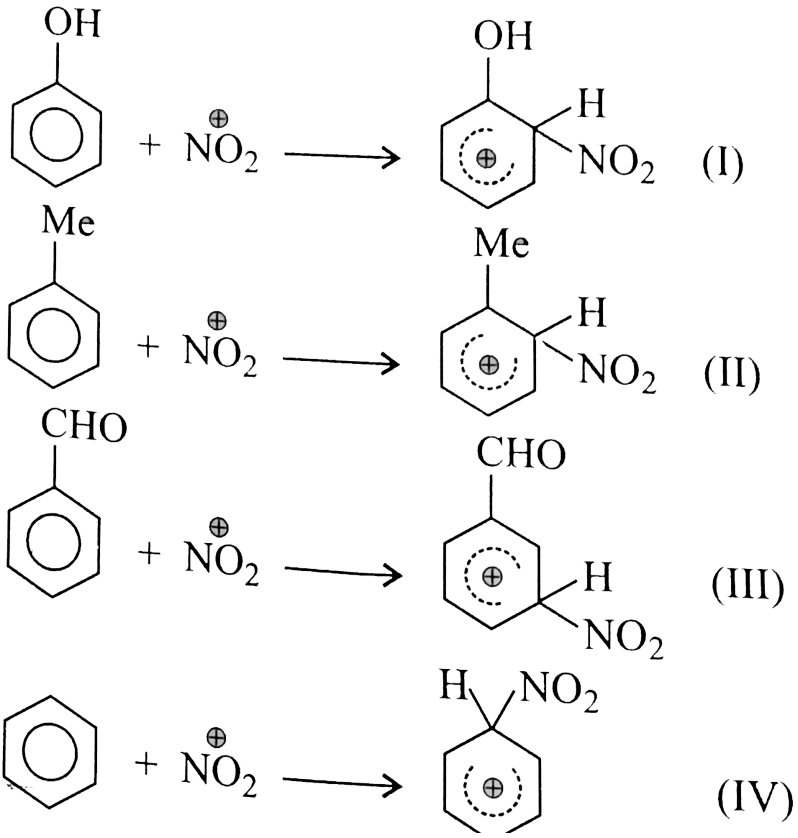
p-, *o*-, and *m*-Bromonitro benzene

d.

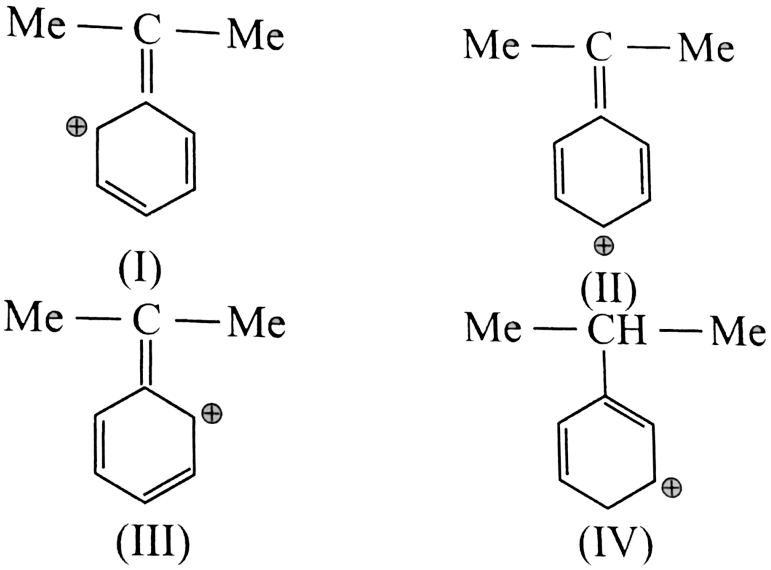


View Text Solution

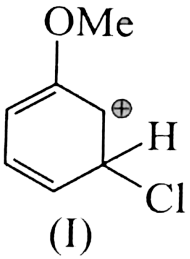
32. Answer the following species (I - IV) according to the decreasing order of potential energy.



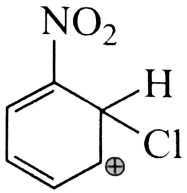
b. Which of the following resonance structures is/are wrong?



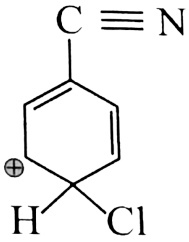
c. Which of the following is/are stable resonating structures?



(I)

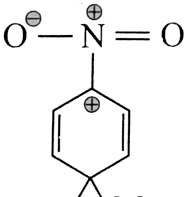


(II)

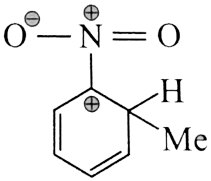


(III)

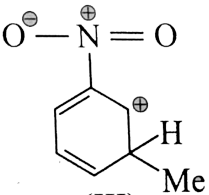
d. Whichof the following is/are least stable arenoinum ion ?



(I)



(II)



(III)

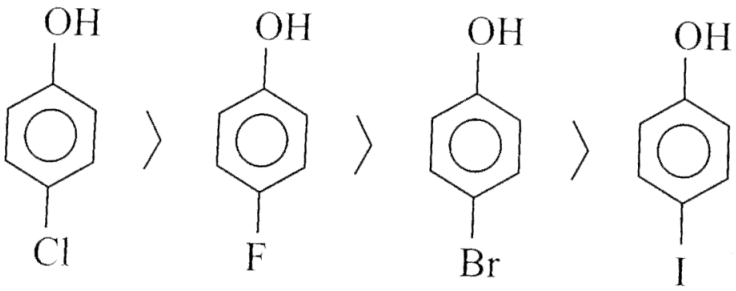
View Text Solution

33. Expalin the following:

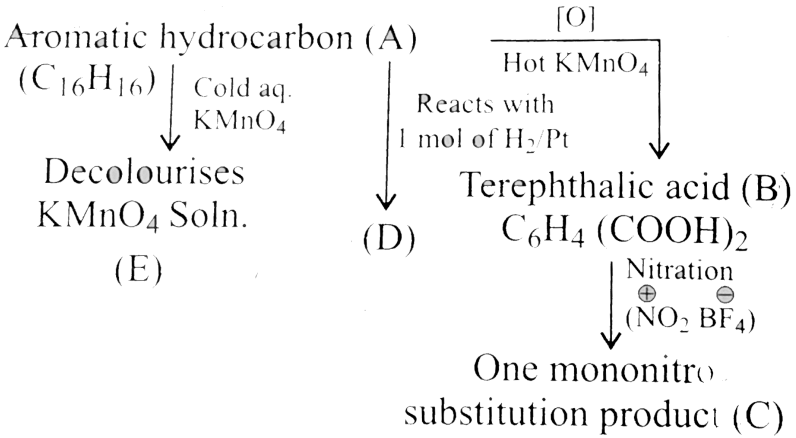
a. Reactivity of halogens in the presence of halogen carrier $\left(FeX_3\right)$ with benzene is $F_2 > Cl_2 > Br_2 > I_2$.

b. The reactivity of halogen-subsituted benzene towards SE reaction is $Phl > PhBr > PhCl > PhF$.

C. The acidic character fo halogen-substituded pehnol is:



View Text Solution

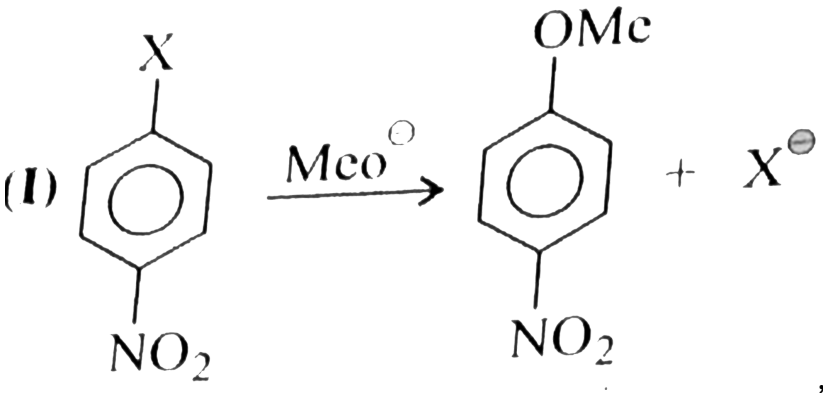


34.

Identify(*A*)to(*E*) .Write the number of possible steroisomers of(*A*).

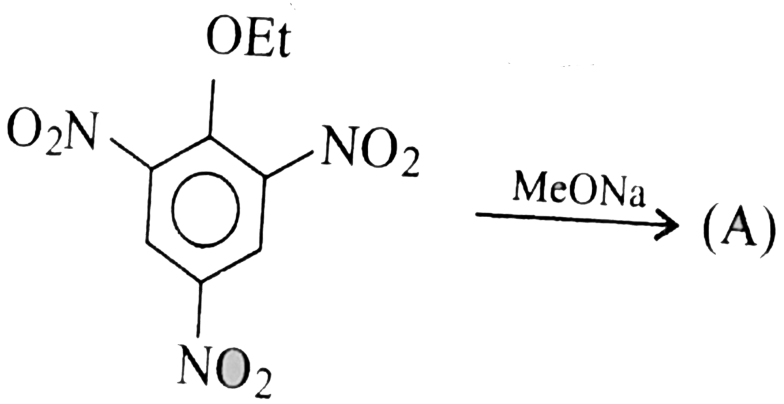
View Text Solution

35. For reaction(I)



,why is the order of reactivity of haldies $ArF > \ > ArCl > ArBr > arl$,although$F^{\circ}$ is a oor leaving group?Explain.

View Text Solution

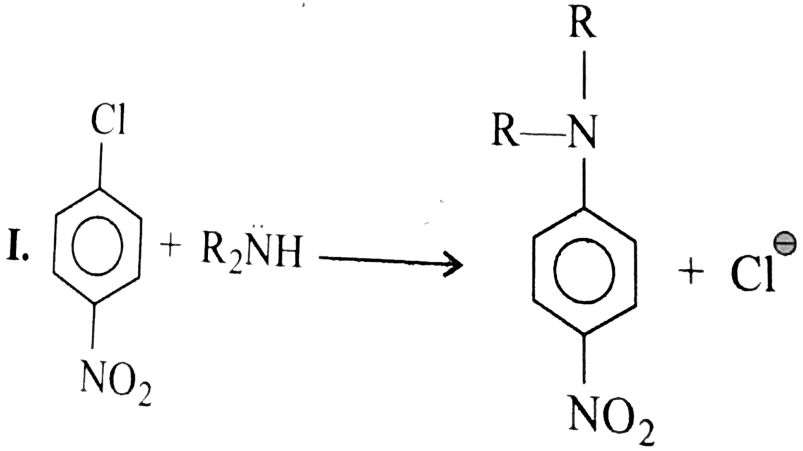


36.

Write is structure of$(A)$and$(B)$and its reasonance structures.

View Text Solution

37. Give the decreasing order of reactivity of the following $ArSN$(addition-elimiantion reaction).



(a) I.

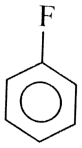
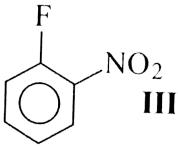
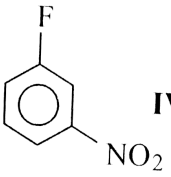
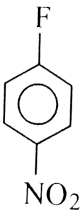
(II)

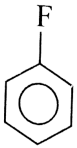
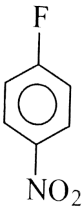
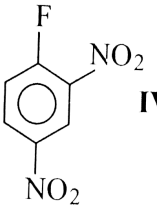
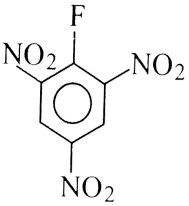
(b)(III)

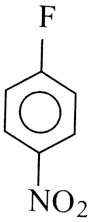
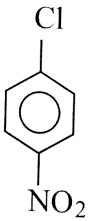
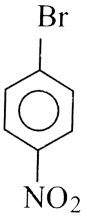
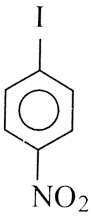
(IV)

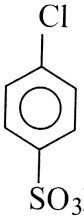
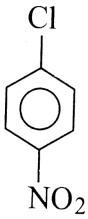
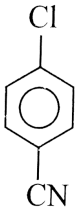
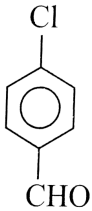
View Text Solution

38. Give the decreaes order of*ArSN*reaction of the following with*NaOMe*:

a. I.  II.  III.  IV. 

b. I.  II.  III.  IV. 

c. I.  II.  III.  IV. 

d. I.  II.  III.  IV. 

View Text Solution

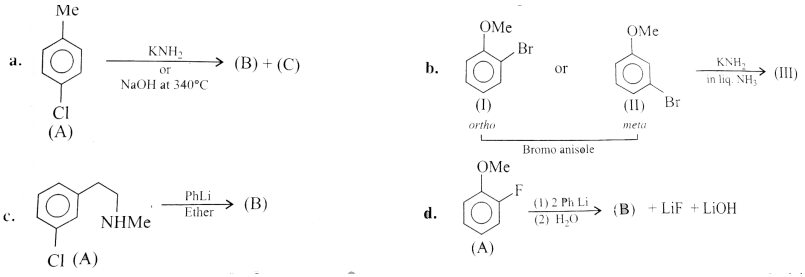
39. (a)Azulene has an appreciabel dipole moment.Write the reasonance structure that explains the dipole moment and its aromaticity.

(b)In the cse of halogen-substituted azulenes,a halogen atom on*C* - 6can

be displace bynucleophile while one on$C$ - 1is unreactive towards nucleophile .Rationalise this differemce in behaviou.

View Text Solution

40. Give the reaction and explain the formation of the products.



View Text Solution

41. (a)$Me_3\mathbb{C}H_2CH(Cl)Ph.$, (b)$MeC(Et)_2CH_2Cl$

(c)$MeCH = C(Br)CH_2Me_2$,(d)m - $ClC_6H_4CH_2CHMe_2$

(e)p - I - $C_6H_4CH(Me)Et$ (f)p - $FCH_2C_6H_4CH_2Cme_3$

(g)$MeCH = CHC(Cl)Me_2$,(h)$MeC(Br)(et)Et$

(i)$MeCH = CHc(Cl)Me_2$,(j)$EtC(Me)_2CH_2Br$

(k)$Me_2CHCH(Br)Me$,(L)$BRCH_2C \equiv \mathbb{C}H_2Cl$

(m)CHF_2BrClF ,(n)(CBr_(3))_(3)CBr)(*o*)MeC(p-BrC_(6)H_(4))_(2)CH(Cl)Me , (*p*)Me_(3)CCH=ClC_(6)H_(4)Cl-m`

View Text Solution

42. Write the stick,condensed and bond line structure of the following compounds:

a.4 - tertButyl-3 - chloroheptane ,b.2 - (2 - Bromophenyl)-1 - chloro octane

c m-Bromochlorobenzene d Perchlorobenzene

e.1 - Bromo-4 - ethyl cycohexane .f2-Fluoro-3 - methyl pentane

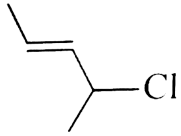
1-Chloro-4sec butyl-2methyl benzene ,1, 4 - Dichloro but-2ene

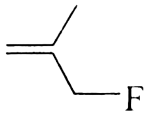
i4 - tert-Butyl-3 - fluoro heptane ,j1iodo-4 - ethyl cyclohexane

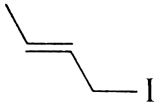
k2 - Fluoro-3 - methyl pentane

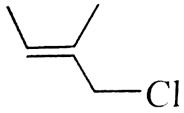
View Text Solution

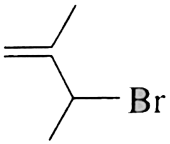
43. Write IUPAC name of the following with(cisort rans)or(EandZ)if any.

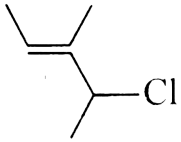
a. 

b. 

c. 

d. 

e. 

f. 

View Text Solution

44. Arrange the following compounds in decreasing order of dipole moment values Explain the order

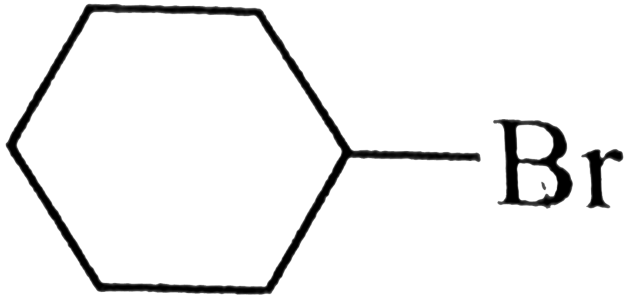
(a) CBr_4, (b) $CHBr_3$, (c) CH_2Br_2, (d) CH_3Br.

Watch Video Solution

45. a. Assign orientation to the three chlorotounes with $\mu = 1.3, 1.78$, and $1.9D$.

b. Assign orientation to the three chloronitrobenzens with $\mu = 2.5, 3.1,$ and $4.3D$

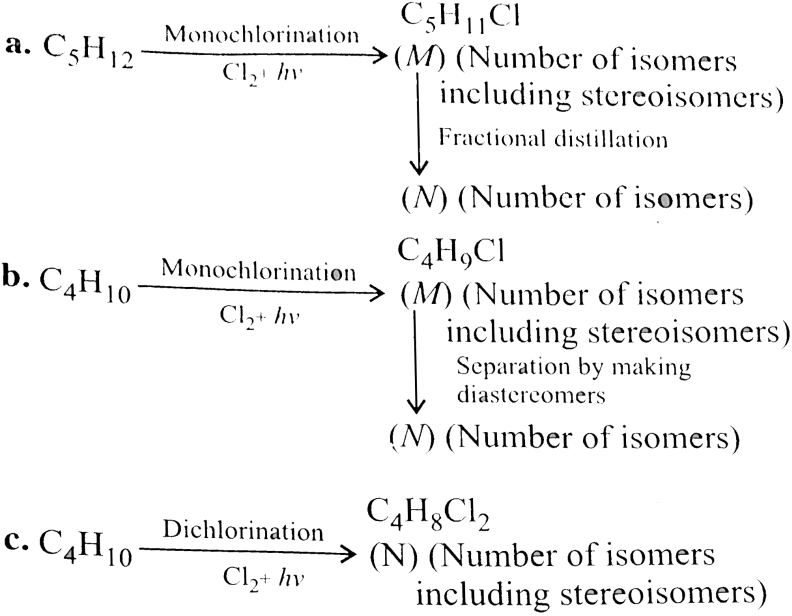
c. Which has higher `mu : (1)

(I) 

or II. $PhBr$?

View Text Solution

46. What are the numerical values of (M) and (N) in the following reaction ?



View Text Solution

47. a. Prepare the following ethers via Willamson's syntesis.

I. *Di* - *n* - propyl ether (*A*0)

II. Benzyl methyl ether (*B*)

III. Phenylethyl ehter (*C*)

IV. *t* - Butyl ethyl ether (*D*)

b. Which compound in the above problem, can be prepared by alternative Williamson's reaction?

c. Explain teh inabiliity of (*A*), (*C*), (*D*) in the above problem to be

preapared via alternate Williamson's syntesis.

d. Give six types of ethers that cannot be syntesised by the typical williamson's synthesis.

e. Rank the following alkyl halides in the decreasing order of reactivity in Willamson's reaction.

$\left(CH_3\right)C$ - $CH_2Br(A)$, $ClCH_2CH + CH_2(B)$,

$ClCH_2CH_2(C)$, $BrCH_2CH_2CH_3(D)$

View Text Solution

48. a. An armatic compound $(A)\left(C_7H_8O\right)$ on reaction with $Br_2 + H_2O$ gives a white ppt. of compound $(B)\left(C_7H_5Obr_3\right)$. Compound (C), an isomer of (A) also gives the same reaction and gives a white ppt. of compound $(D)\left(C_7H_5OBr_3\right)$. Compound (C) is insoluble in $NaOH$. identify (A), (B), (C) and (D).

b. I. Starting from C_6H_6 and C_6H_5OH, synthesise phenyl 1 - $2, 4$ - dinitrophenyl ether (B).

II. Could we have first prepared and then nitrated Ph_2O ?

c. 4 - Chlorobutanol $\xrightarrow{\ominus OH}$ $(A) \rightarrow (B) + Cl$

d. $HOCH_2 - CH_2 - CH_2OH \xrightarrow[160-170^\circ C]{\text{Conc.}\ H_2SO_4}$

View Text Solution

49. Indentify (A) to (E).

a. 1, 3 - Butadience $+ Br\mathbb{C}l_3$ + Preoxide $\rightarrow (A)$

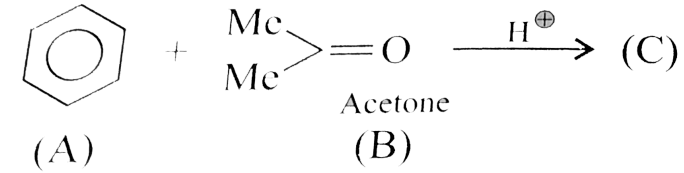
b. $RCH = CH_2 + \mathbb{C}l_4 \xrightarrow{\text{Peroxide}} (B) + (C)$

c. 1 - Octene $+ CHCl_3 \xrightarrow{\text{Peroxide}} (D)$

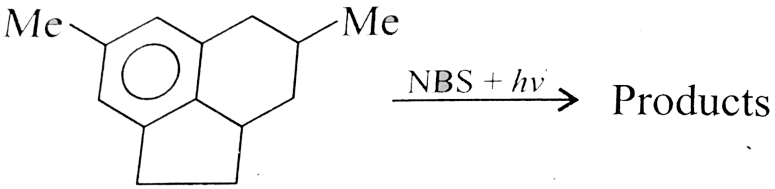
1 - Octene $+ CbrCl_3 \xrightarrow{\text{Peroxide}} (E)$

View Text Solution

50. a.Complete the following:

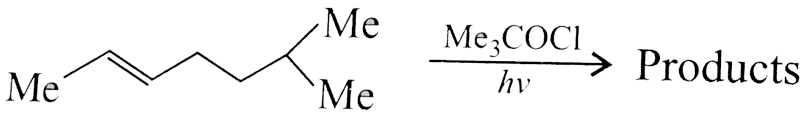


b.



Identify all the possible products. Give the major product and racnk the products in decreasing order of reactivity with *NBS*.

c.



Indentify all the possible products. Give teh major products and list them in decreasing order of reactivity with Me_3CoCl.

View Text Solution

51. a.Explain the following

a. Dipole moment of CH_3F is $1.85D$ and that of CDF is $1.86D$.

b. 8 - Hydroxy quinoline can be separarted from 4 - hydroxy quinoline by

steam disillation:

c. The boiling point of $\left(C_2H_5\right)S > \left(C_2H_5\right)_2O$.

d. The pK_a of o - fluorobenzoic acid (I) is 4.14, wheraes that of p - chlorobenzic acid (II) is 3.99.

e. Glycine exists as zwitterion , but $PABA$ does not.

f. Write teh structure of carbocation produced on treatment of a compound $(A)\left(Ph_2CHC(OH)Me_2\right)$ with SbF_5/SO_2.

View Text Solution

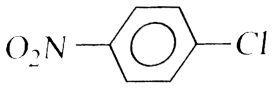
52. a. The dipole moment of HBr is $2.6 \times 10^{-30} C.m$ and intertomic spacing is $1.41Å$. What is the percent ionic character of HBr ?

b. A diatomic molecule has $\mu = 1.2D$. Its bond distance is $1.0Å$. What fraction of electronic charge exists on each atom ?

c. In water, $(H - O - H)$ bond angle is 105°. The distance between $(O - H)$ is $0.94Å$. μ of $H_2O = 1.85D$. Determine the magnitude of the charge on the oxygen atom in water molecule and hydrogen atom.

d. Bl_3 is a symmetrical planner molecule, all the $(B - 1)$ bonds lie at 120° of each other. The distance between the I atoms is $3.54Å$. THe Estimate

the covalent radius of boron. e. Calculate the dipole moment of the following compound:

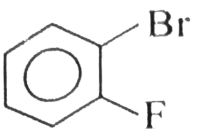


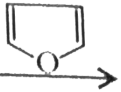
Given : $\mu_{C-Cl} = 1.55\ D$

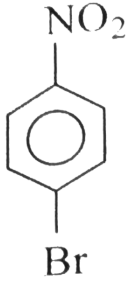
$\mu_{C-NO_2} = 3.95\ D$

View Text Solution

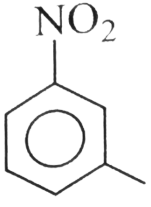
53. Complter the following:

f. 

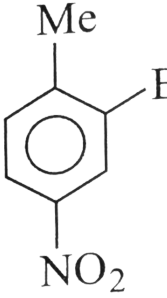
$\xrightarrow{Li/Hg}$ (F)  (G)

g. 

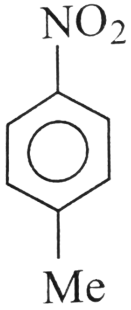
$\xrightarrow[C_2H_5OH]{KCN,\ \Delta}$ (H)

h. 

$\xrightarrow[C_2H_5OH]{KCN,\ \Delta}$ (I)

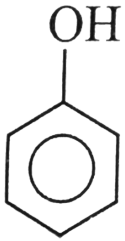
i. 

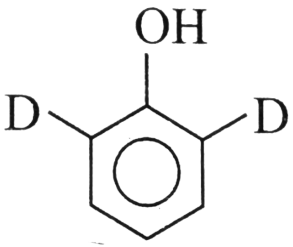
$\xrightarrow[C_2H_5OH]{NaCN,\ \Delta}$ (J)

j. 

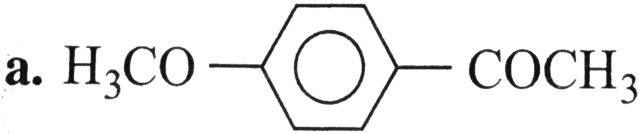
$\xrightarrow{Br_2,\ Fe}$ (K) $\xrightarrow[(ii)\ H_2O]{(i)\ KCN}$ (L)

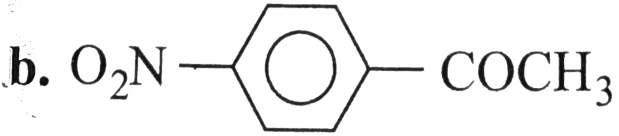
II. Which of the folliwng has the greater K_a value?

i. 

ii. 

III. Which of the carbonyl groups in (a) and (b) protonate more readialy in acid solution and why ?

a. 

b. 

IV. When a trace of KNH_2 is added to a solution of chlorobenzene and potassium triphenyl mehide $\left(Ph_3C^{\circ}K^{\oplus}\right)$ in liquid NH_3, a rapid reaction takes place to yield a product of formula $C_{25}H_{20}$. What is the product? What is the role of KNH_2) and why is it needed?

View Text Solution

54. a. Indicate whether the following are SN^{-1}, SN^{-1}, $E1$, or $E2$

1. $\left(CH_3\right)_3CBr + C_2H_5OH$ at

$60^\circ \rightarrow \left(CH_3\right)_3C(\text{Major}) - OC_2H_5 + \left(CH_3\right)C(\text{Minor}) = CH_2$

2. $CH_3CH_2CH_2Br + LiAlH_4 \rightarrow$

3. $CH_3CH_2Br + Cl + I^{\ominus} \rightarrow$

4. $\left(CH_3\right)_3CBr + CN^{\ominus}(\text{Etanol}) \rightarrow$

5. $CH_3CHBr - CH_3 + \overset{\ominus}{O}H\left(H_2O\right) \rightarrow$

6. $CH_3CHBr \rightarrow CH_3 + \overset{\ominus}{O}H(\text{Ethanol}) \rightarrow$

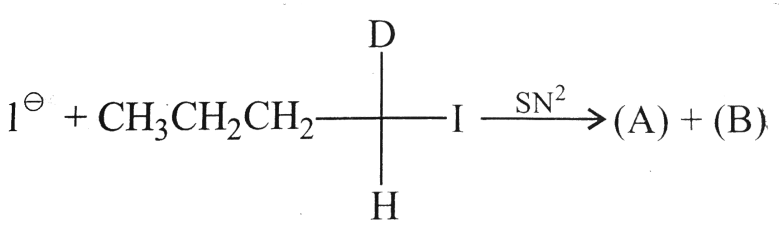
7. $\left(CH_3\right)_3CBr + H_2O \rightarrow$

b. Give teh decreasing order of reactivity of the alkaline hydrolysis of the following alkyl halides towards (1) SN^{-1} (2) SN^2 and (3) in the presence of $AgNO_3$:

i. $\left(CH_3\right)_2C(Br) - C_2H_5$ ii. $C_5H_{11}Br$.

iii. $C_2H_5CH(Br)C_2H_5$.

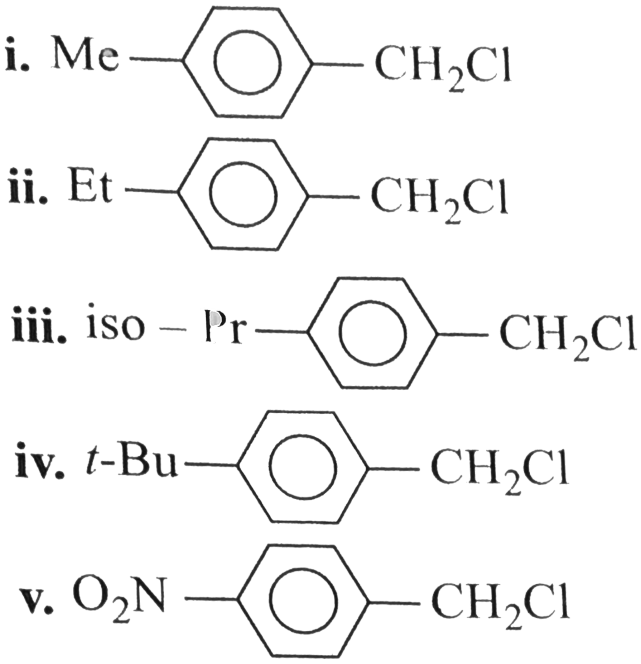
c.



d. Give teh decreasing order of reactivity of alkaline hydrolysis of the

followong halides towards SN^{-1}:

1. $MeCl$, ii. $PhCH_2Cl$, iii. Oh_2CHCl, iv. $Ph_3\mathbb{C}l$



2.

e. Determine the relative SN^{-2} reactivity with $NaCN$ in aprotic $DMSO$ of the following alkyl halides:

1. i. $CH_3CHClCH_2CH_3$

ii. $CH_3CHBrCH_2CH_3$

iii. $CH_3CHlCH_2CH_3$

2. iv. $CH_3CH\left(CH_3\right)CH_2CH_2I$

v. $CH_3CH\left(CH_3\right)CHICH_3$

vi. $CH_3CI\left(CH_3\right)CH_2CH_3$.

3. vii. 4 - Bromo 1, 1 - dimethylcyclohexane

viii. 1 - Bromo -cis or trans- 1, 4 - dimethycyclohexane

ix. cis or trans - 2 - Bromo-cis- 1, 3 - Dimethyl-cyclohexane

f. Optically pure (+) - 2 - bromoctane, $[\alpha] = +36^\circ$ reacts with aq. $NaOH$ in actone to give opstically pure (-) - 2 - octonal, $[\alpha] = -10.3^\circ$. With partically racemised bromo compound whose $[\alpha] = +30^\circ$, the $[\alpha]$ of alchold product is -6.0°. Cacualte:

1. The percentage optical purity of partically racemised bromo compound and alchocol,

2. the percentaage of inversion and racemission, and

3. the percentaage of frontside and backside attack.

g. Compare teh rates of SN^{-1} and SN^{-2} reactions of:

1. Cycloprophyl and cyclopentyl chloride

2. Vinyl chloride

h. Arrange the following in the order of decresing basically:

1. $F^{\ominus}$, 2. overset(⊖)(O)H3. $\overset{\ominus}{N}H_2$, 4. $\overset{\ominus}{C}H_3$

a. $4 > 3 > 2 > 1$, b. $1 > 2 > 3 > 4$,

c. $2 > 1 > 3 > 4$, d. $3 > 2 > 1 > 4$

i. Arrange the following in the order of decresing nuclepphillic character:

1. H_2O, 2. $OH^{\ominus}$, 3. $CH_3O^{\ominus}$, 4. $CH_3COO^{\ominus}$

i. 2 > 3 > 4 > 1, ii. 3 > 2 > 1 > 4

iii. 1 > 4 > 2 > 3, iv. 4 > 1 > 2 > 3

j. Arrange the following in teh decreasing order as a leaving griup in substitution reaction.

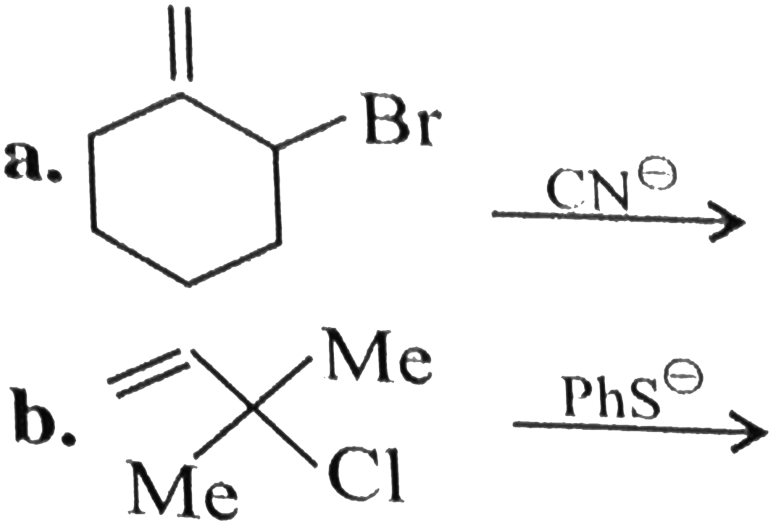
1. CH_(3) CO overset(⊖), 2. C_(6) H_(5)O^(⊖)C_(6)H_(5) SO_(3)^(⊖), 4. CH_(3)O^(⊖). *a*. 3gt1gt4gt2, *b*. 3gt1gt2gt4*c*. 3gt2gt1gt4, *d*. 4gt2gt1gt3

k. *The* or *derof* ≤ *av* ∈ *ggrouabilityf* or *thefollow* ∈ *gis*: 1. -OAc, 2. -OMe3. -OSO_(2)Me, *b*. 4. -OSO_(2) CF_(3)*a*. 1gt2gt3gt4, *b*. 4gt3gt1gt2*c*. 3gt2gt1gt4, *d*. 2gt3gt4gt1`

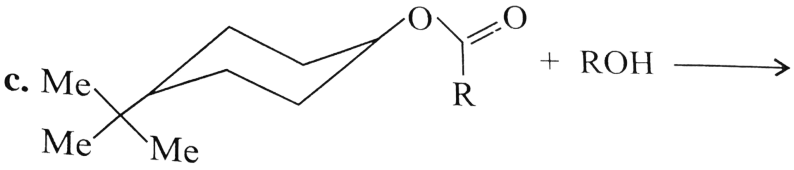
View Text Solution

55. Explain why solvolysis (where the solvent is nucleophillic) appears to follow a first-order rater law, rather than a secound order.

II. Complete the following:



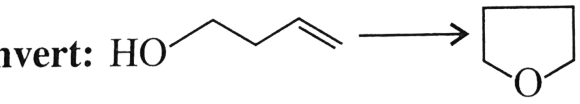
III. Predict the product of each SN^2 reaciton Insicate sterochemistry where apporopriate.

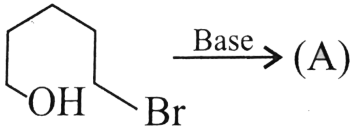


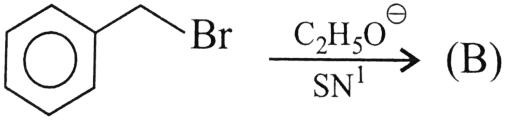
IVgt Why is $PhO^{\ominus}$ a weaker nucleophile than $RO^{\ominus}$?

View Text Solution

56. I. 5 - Chloro-1.3 - cylopentadience undergoes SN^{-1} solbolysis in the persence of Ag' ion slowly, even though chlorine is doubly allylic, and allylic halides normally ionise reasily. Expalin.

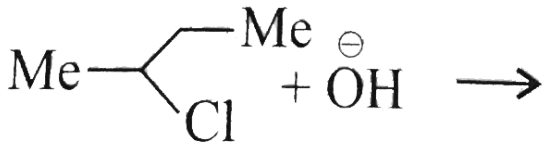
II. **Convert:** 

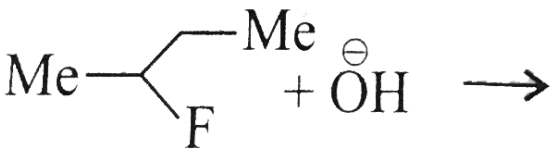
III. **Identify:** **a.** 

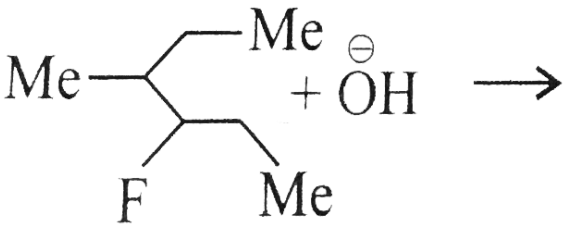
b. 

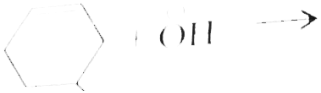
IV. 1 - Choloro -2 - (dimethylamino) propane (*A*) after standing for several weeks in a sealed contaniner changes to 2 - chloro -1 - (dimethylamino) propane (*B*). Explain.

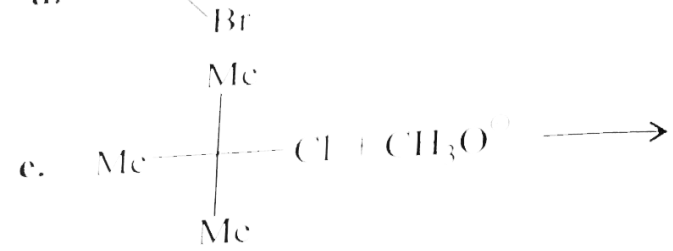
V. Give the major major products of the following elimination reactions:

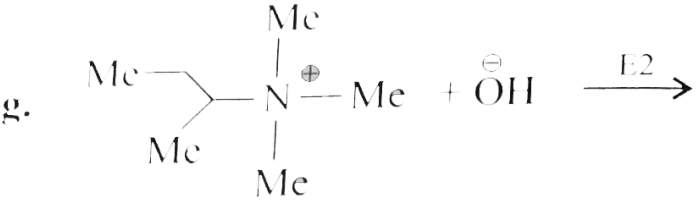
a. 

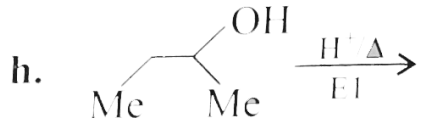
b. 

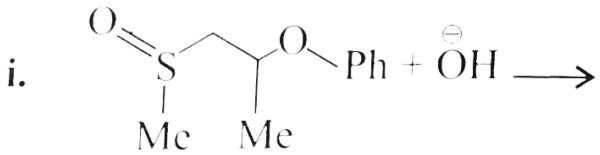
c. 

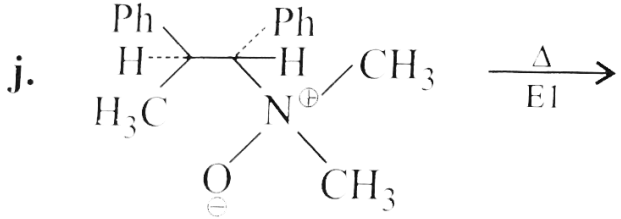
d. 

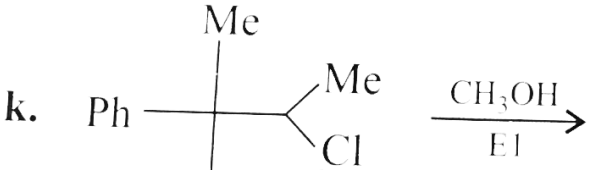

Br
e.
Me
Me
Me
Cl + CH_3O^-
f.
Me
Me
Me
O^- + CH_3X


g.
Me
Me
N
Me
Me
Me
$\overset{\ominus}{O}H$
E2


h.
OH
Me
Me
H⁺ Δ
E1


i.
O
S
O
Ph + $\overset{\ominus}{O}H$
Me
Me

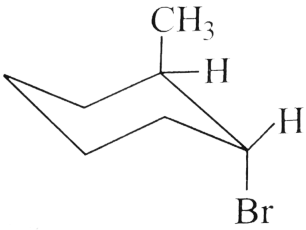

j.
Ph
Ph
H
H
CH_3
H_3C
N
O
CH_3
Δ
E1


k.
Me
Ph
Me
Cl
CH_3OH
E1

Me

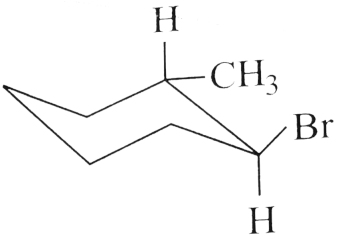
View Text Solution

57. I. Which of the following will solvolyse faster is SN^{-1} and why?



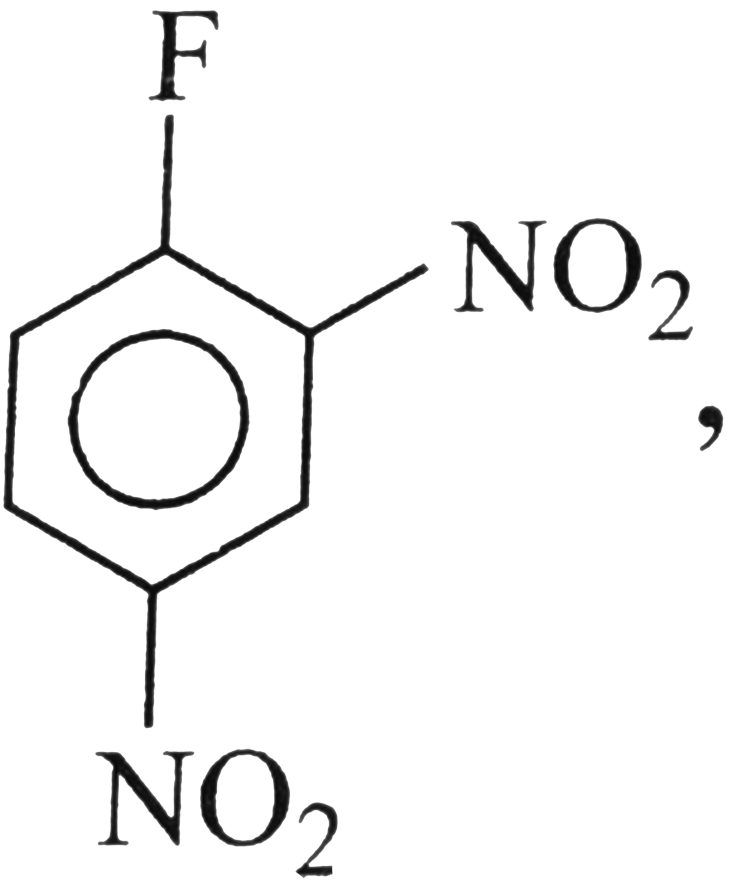
(A)

and



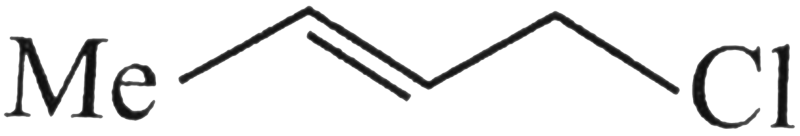
(B)

II. $F^{\ominus}$ works as a good leaving group in $ArSN$ reaction



,

even though it is a por leaving group in alipatic SN^{-1} and SN^{-1} mechanisms. Exaplin.

III. When 

reacts with alc. KCN, a mixture of ismeric products is obtained. Explain.

View Text Solution

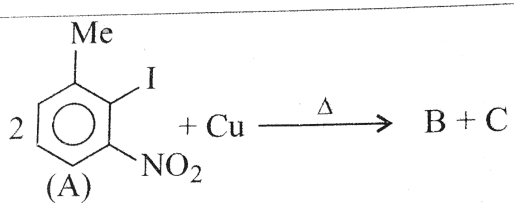
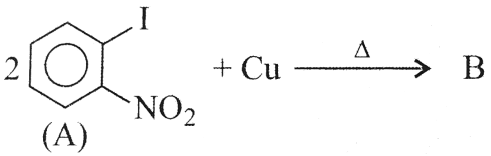
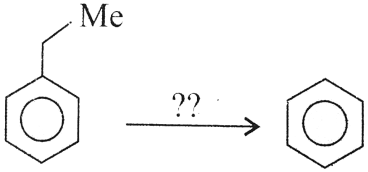
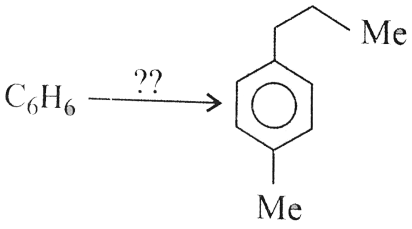
Solved Examples

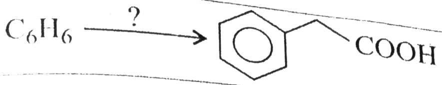
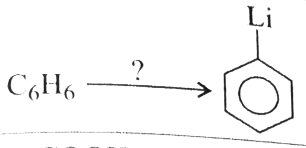
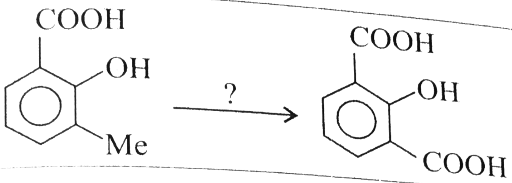
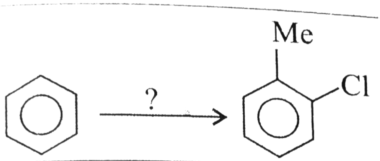
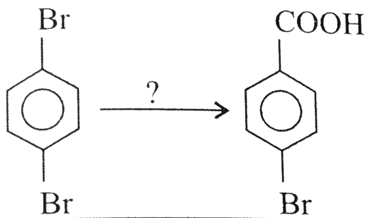
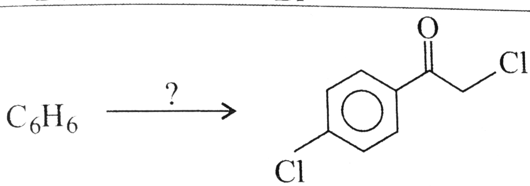
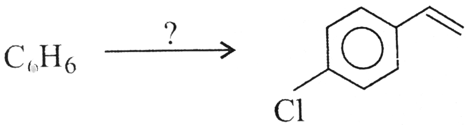
1. Benzene, touene, xylene (o, m, p) and mesitylene dissolve in HBF_4 to from salts. Expalin the order of basicity:

Mesitylene $>$ m - Xylene $>$ o - and p - Xylenen gt Toulene gt Benzene

View Text Solution

2. Complete the following :

a.	
b.	
c.	
d.	

e.	
f.	
g.	
h.	
i.	
j.	
k.	
l.	$C_6H_6 \xrightarrow{?} PH—CH \equiv CH$

3. a. The treatment of RX with aqueous KOH leads to the information of alcohols but in the presence of alcholic KOH or $NaOH$, alkenes are the major products. Expalin why.

b. CHF_3 is less acidic than $CHCl_3$. Explain.

c. Wurtz reaction in case of tert-alkyl halide fails. Explain.

d. Dipole moment of C_6H_5Cl is lower than that of $C_6H_{11}Cl$ (cuclohexul choride). Expalin why.

e. Why should Grignard reagent be prepared under anthydrous conditions?

f. Why does p - dichlorobenzene have higher melting point and lower solubility than o - and m - isomers ?

View Text Solution

4. Give the decreasing order of following with their properties as indicated.

A. Decreasing basic, mucliophllic and fugacity orders:

a. I, H_(2)O, II. CH_(3)OH, III. O overset(o-)(H), IV. CH_(3)O^(o-)b. I. H_(2)O

, *II*. C_(2)H_(5) OH, *III*. $\overset{\oplus}{O}H$, IV. $C_2H_5O^{o-}$

c. I. $HCO_3^{\oplus}$, II. F^{o-}

III. $F_3C - COO^{o-}$, IV. NO_3^{o-}

B. The decreasing order of *ArSN* reaction:

a. I. *PhCl*

II. *p* - NO_2 - C_6H_4 - *Cl*

III. 2, 4, 6 - Trinitro chlorobenze

IV. 2.4 - Dintro chlorobenzene

I. *PhF*

II. *p* - NO_3S - C_6H_4 - *F*

III. *p* - *HOOC* - C_6H_4 - *F*

IV. I*p* - NO_2 - C_6H_4 - *F*

C. I. *PhCl*

II. *p* - NO_2 - C_6H_4 - *Cl*

III. *o* - NO_2 - C_6H_4 - *Cl*

IV. *m* - NO_2 - C_6H_4 - *Cl*

C. The decreasing order of *SE* reaction:

a. I. *PhCl*, II. C_6H_6

III. $PhCH_3$, IV. *PhOMe*

b. I. PhCH_(3)*II*. o-MeO-C_(6) H_(4) - Me*III*. m-MeOC_*(6) H_(4) - Me*IV*. p-MeO - C_(6)H_(4) - Me*c*. *I*. PhNH_(2), *II*. PhNHCHOCH_(3)*III*. PhNHCOPh, *IV*. PhNHTs*d*. *I*. PhNH_(2)*II*. o-NP_(2) - C_(6) H_(4) - NH_(2)*III*. m-NUO_(2) - C_(6) H_(4) - NH_(2)*IV*. p-NO_(2) - C_(6) H_(4) - NH_(2)`

View Text Solution

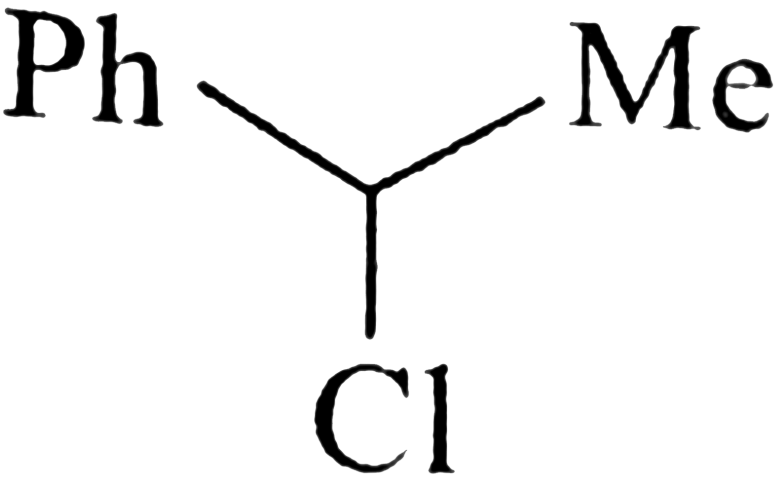
5. Distingulish between the following compounds:

a. I. *m* - Iosotoluene and II. Benzyl iodide.

b. I. *p* - Bromonisole and II. *p* - nitrobromoobenzene,

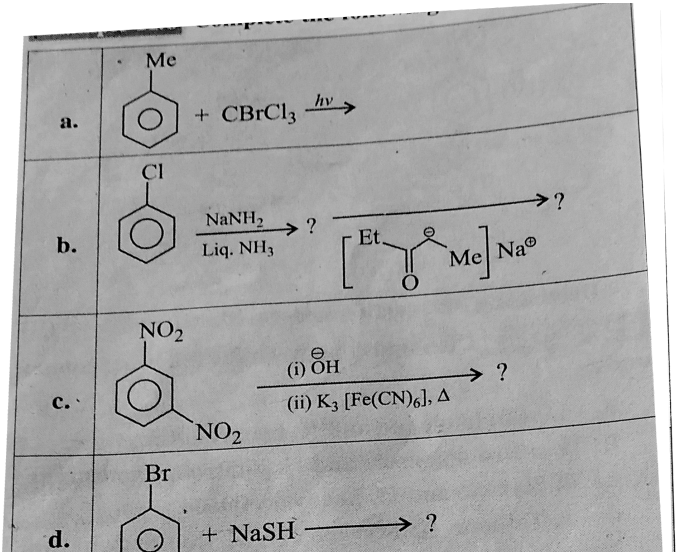
c. I. Styrene and II. Phenylacterlyelen,

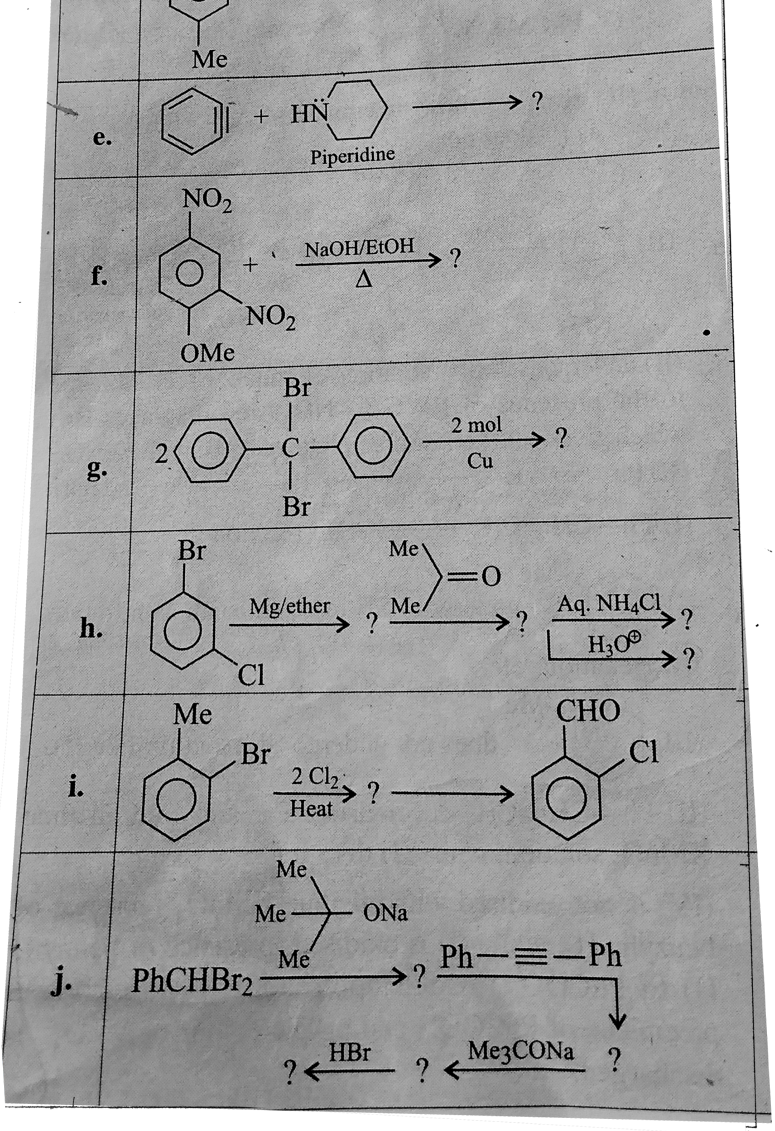
d. I. Touene II. Stryene III. Methyl cyclohexane, IV. `PhCMe_(3) V.

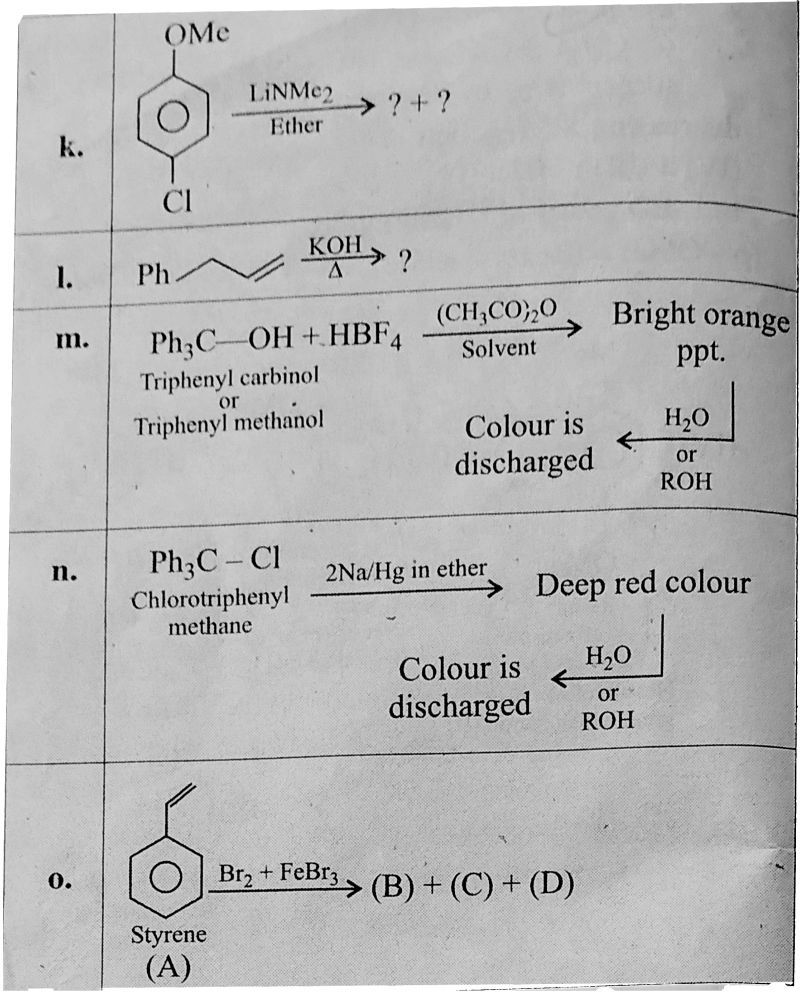


View Text Solution

6. Complete the following reactions:

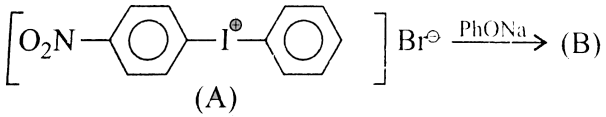


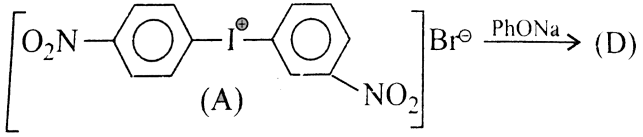

Me
e.
+
HN
Piperidine
?
f.
NO2
+
NaOH/EtOH
Δ
?
NO2
OMe
g.
Br
2
C
2 mol
Cu
?
Br
h.
Br
Mg/ether
?
Me
Me
=O
?
Aq. NH4Cl
?
H3O⊕
?
Cl
i.
Me
Br
2 Cl2
Heat
?
CHO
Cl
j.
Me
Me
ONa
Me
PhCHBr2
?
Ph—≡—Ph
?
HBr
?
Me3CONa
?

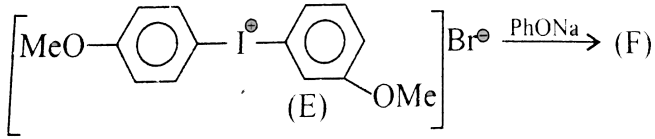


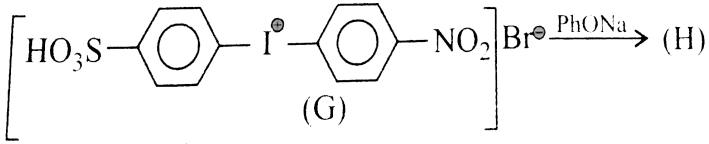
View Text Solution

7. Indicate the position where *ArSN* reaction will take place and explain why.

a. 

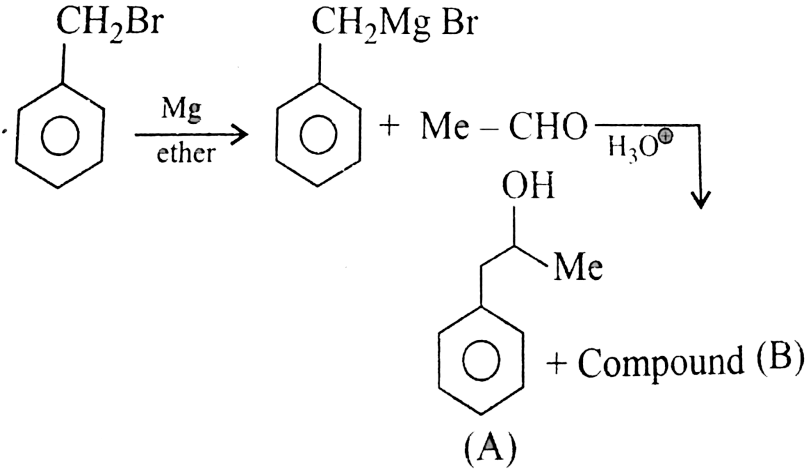
b. 

c. 

d. 

Watch Video Solution

8.

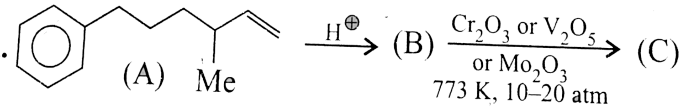


Compound (*B*) is an ismoer of (*A*0. Compound (*B*) shows positive iodoform test and gives *o* - toule acid. What is (*B*) ? Explain its formation.

Watch Video Solution

9.

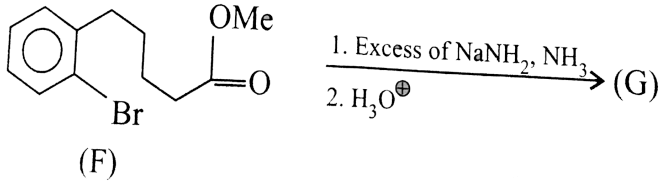
a.



b. Styrene $\xrightarrow{H^{\oplus}}$ (E)

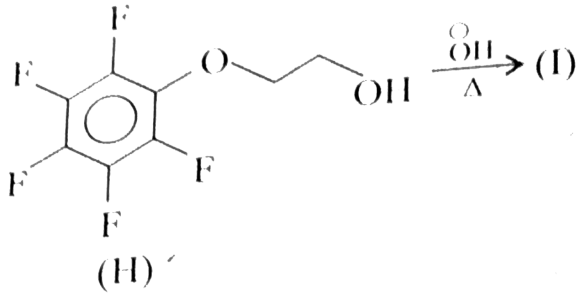
(D)

c.



(F)

d.



(H)

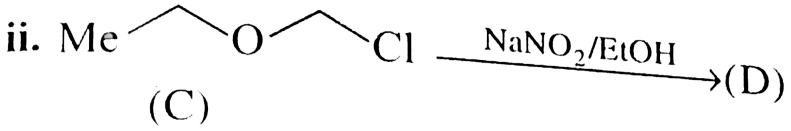
View Text Solution

10. a. Account for the rapid rate of ehanoulysis id

, although it

is $1^{\oplus}$ halide.

Explain the following reactions:

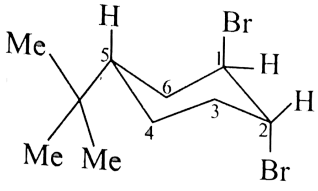
ii. 

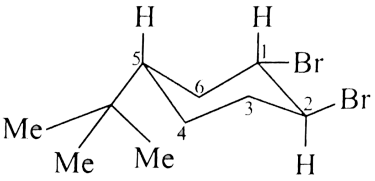
View Text Solution

11. I. Give the product of debromnination of with Kl in acetone solution of the folloiwing.

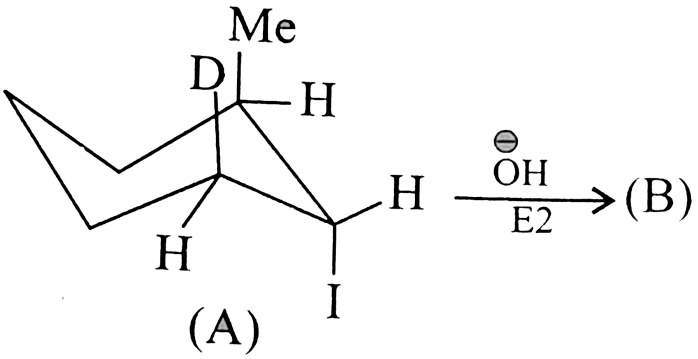
a. Erythro or mes-2, 3 - dibromobutane

II. Expalin why (A) readily forms alkene with 1^{o-} but (B) does not.





III. Give the major product of the following reaction:

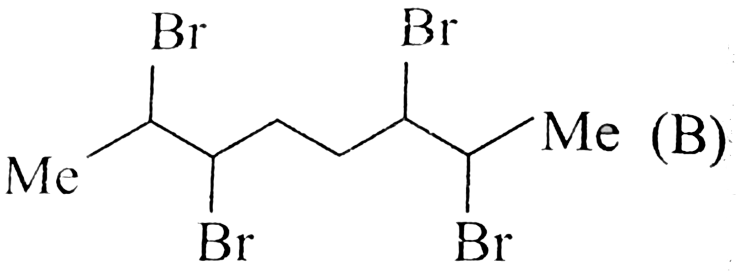


View Text Solution

12. Syntesise the following:

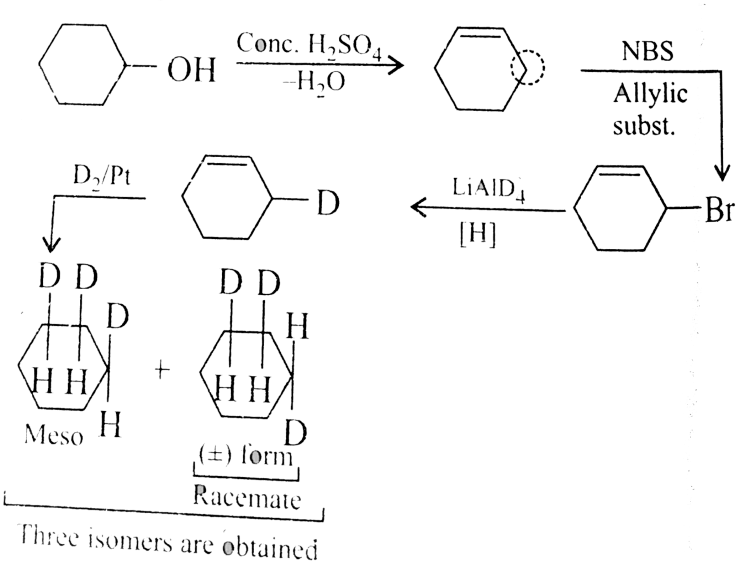
a. Cyclohexanol (A) to $1, 2, 3$ - tridenuterocy cloxane (B).

b. E - but 2 - $e \neq$ to



i. Which diastermoer of $(B0$ is obtaine?

ii. If Z - But 25 - $e \neq$ is used, which diastermoer of (B) is obtained?

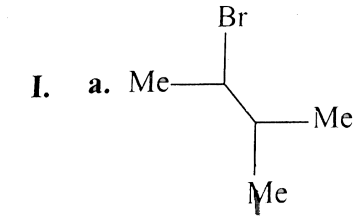


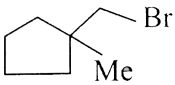
c.

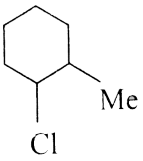
What is product (C) ? Which reaction [(1) or (2)] is faster and why?

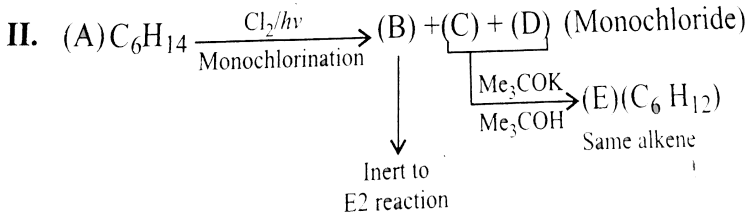
View Text Solution

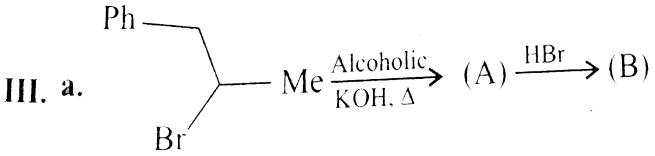
13. Give the majore product, when the following compounds are treated with sodium methoxide.

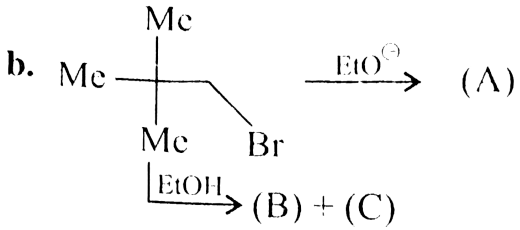
I. **a.** 

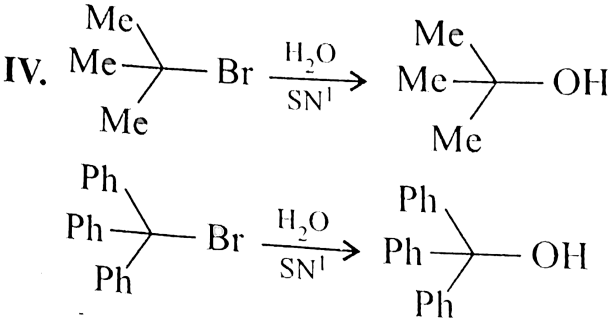
b. 

c. 

II. 

III. **a.** 

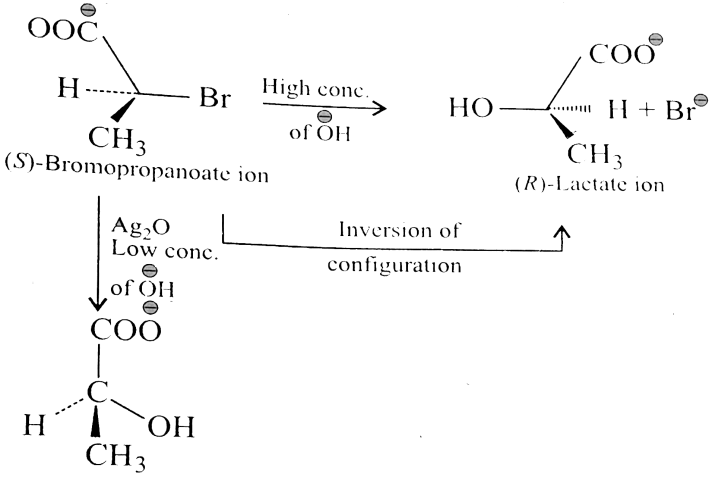
b. 

IV. 

Equaction (*I*) shows no effect with the addition of $Br^{\ominus}$ to the reaction but Eq. (2) shows the common ion effect of $Br^{\ominus}$ if supplied from external

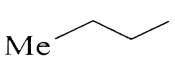
source. Why?

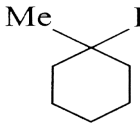
V.

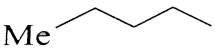


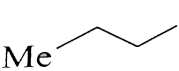
View Text Solution

14. I. Which of the following solvents is the reaction faster?

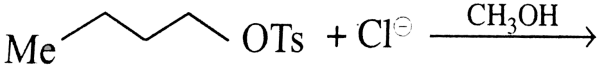
a.  + NH_3 in 20% CH_3OH and 80% H_2O or 40% CH_3OH and 60% H_2O.

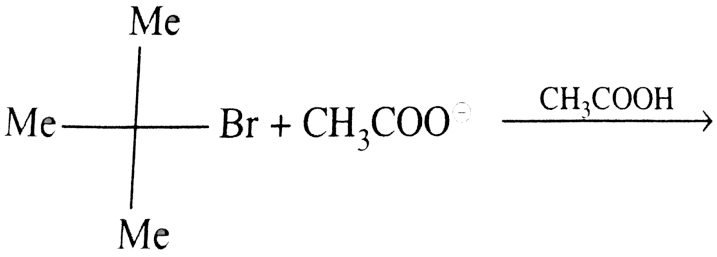
b.  in CH_3OH or EtOH.

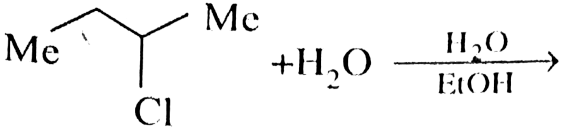
c.  + $\overset{\ominus}{O}H$ in CH_3OH or 50% CH_3OH + 50% H_2O.

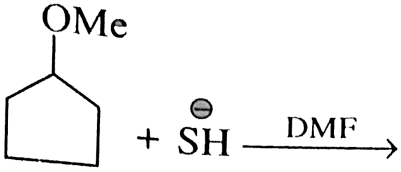
d.  + $:\overset{\ominus}{C} \equiv N:$ in EtOH or DMSO.

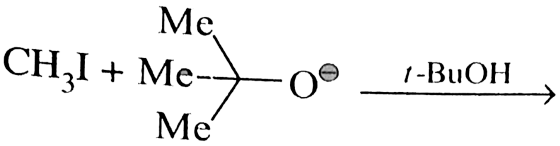
II. Indicate SN^{-1} or SN^2.

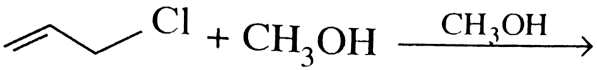
a. 

b. 

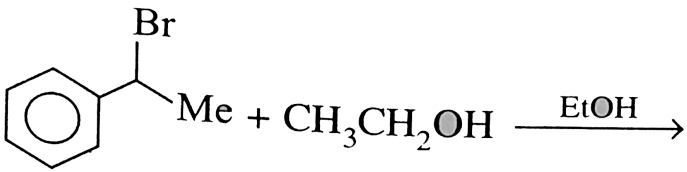
c. 

d. 

e. 

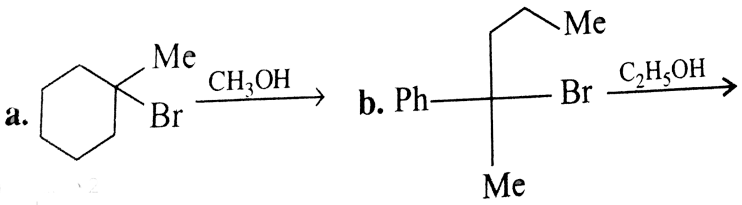
f. 

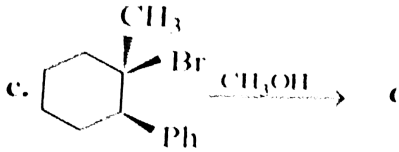
g. 

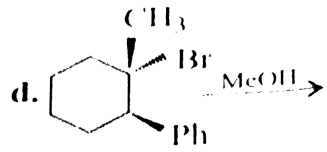
h. 

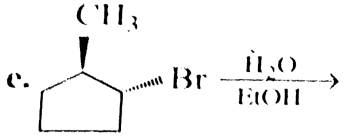
View Text Solution

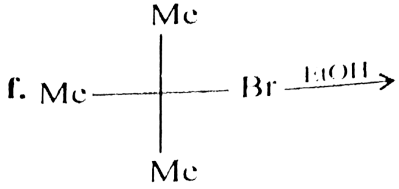
15. I. Give the products of the following:



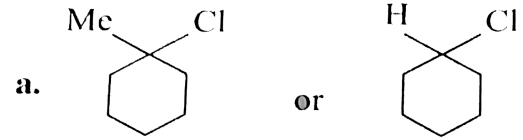


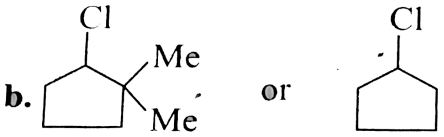


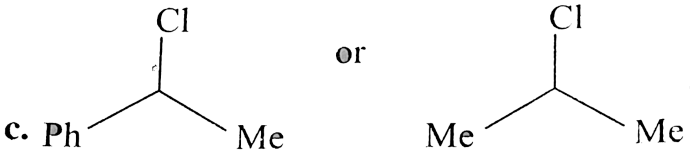




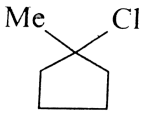
II. Which has faster rate of SN^{-1}?

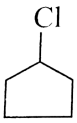


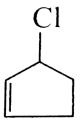


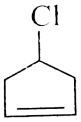


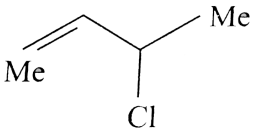
III. Which has faster rate of SN^{-1}?

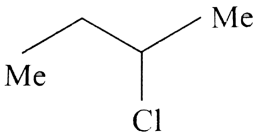
a. 

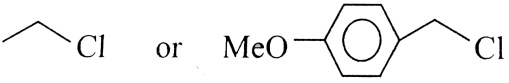
or 

b. 

or 

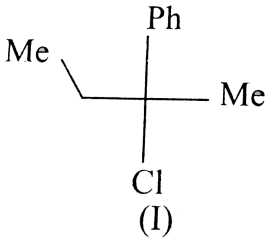
c. 

or 

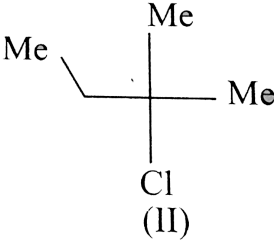
d. 

IV. Give the decreasing order of:

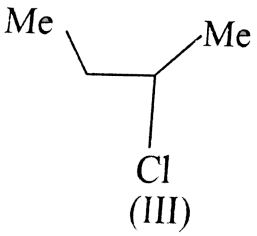
a. SN^1:



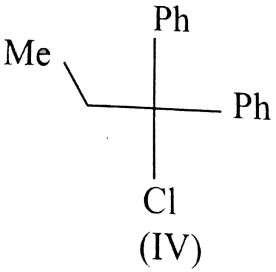
(I)



(II)



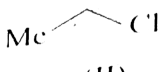
(III)



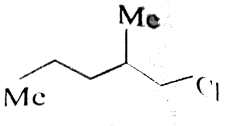
(IV)

b. SN^2:

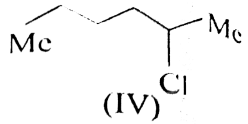
(I)



(II)

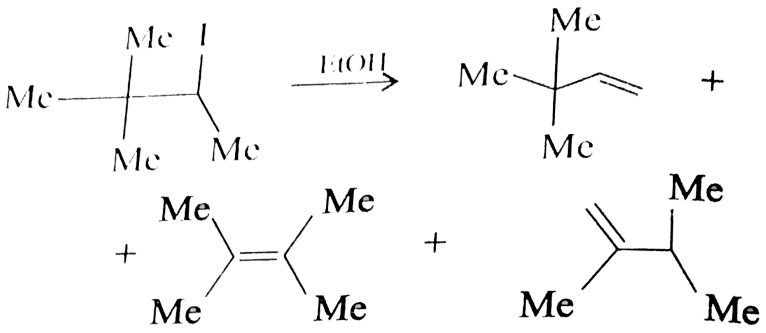


(III)



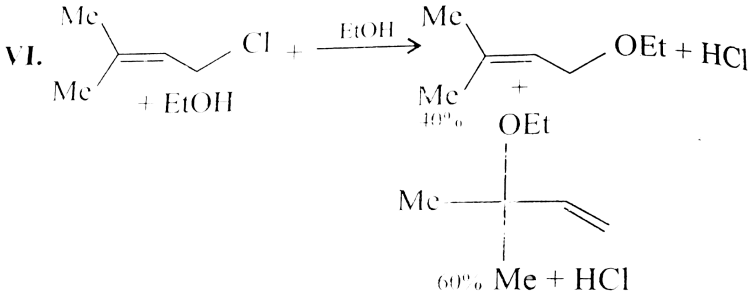
(IV)

Show the mechanism for the fromation of there products and sub-products.

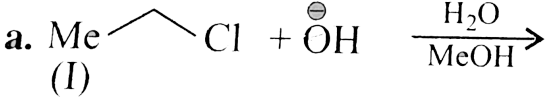


Explain teh formtaion and mechanism.

VII. Explain wheter these reactions would follow the SN^{-1} or SN^{-2} and which is faster.

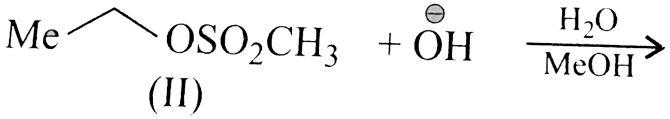


VIII. What are the products of the following reactions?

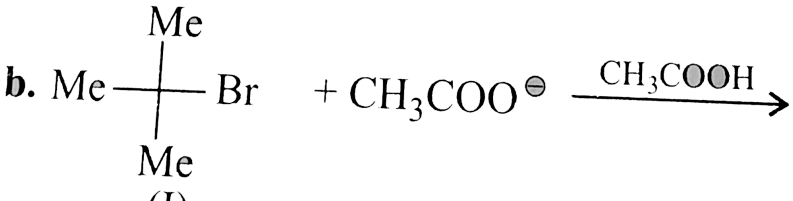
a. 

(I)

or

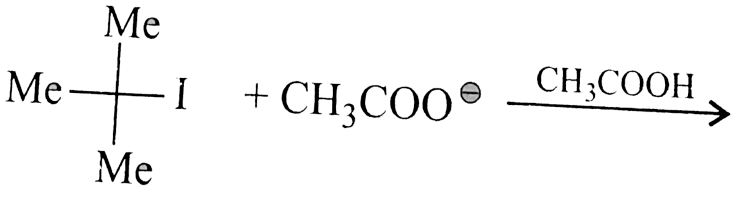


(II)

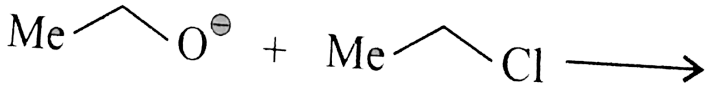
b. 

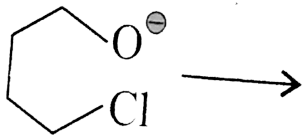
(I)

or

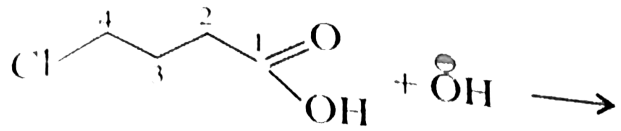


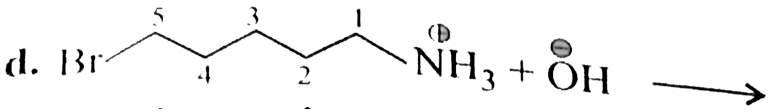
(II)

a. 

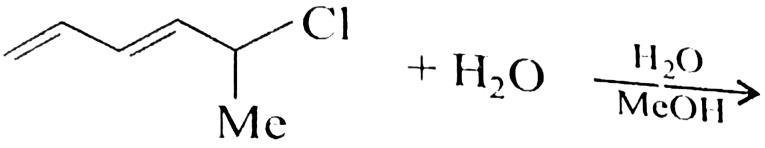
b. 

IXgt a. This reacation gives three subtituion products. Show teh structure.

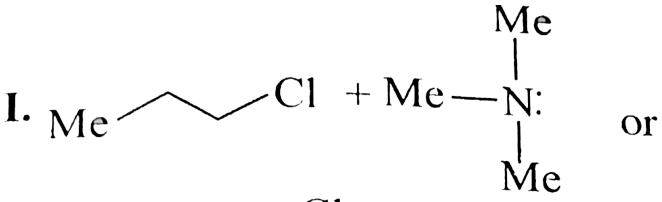
c. 

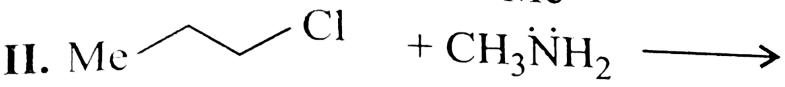
d. 

b. Which has faster rate?

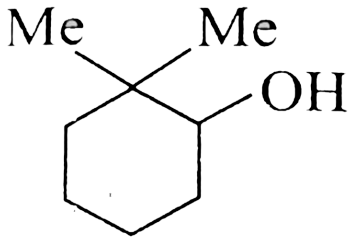


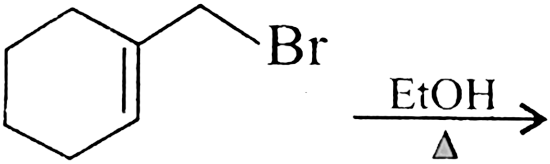
X. GIve teh products of the following:

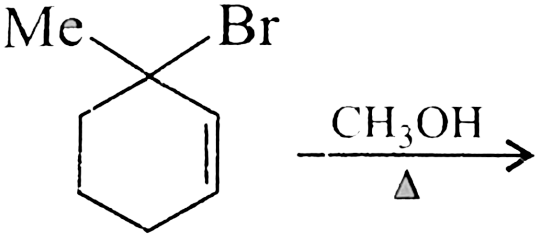
I. 

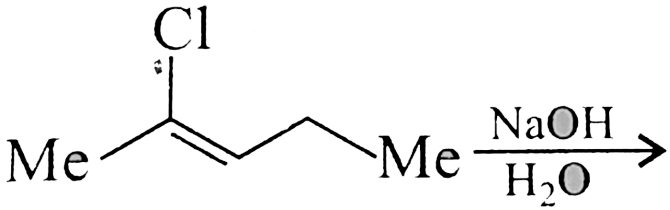
II. 

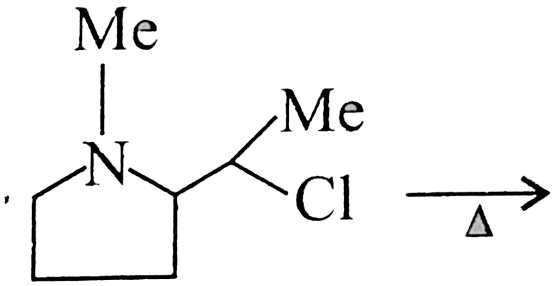
XI. Which is more reactive towards acid-catalysed hydration and explain the regiochemistry of the alchohol formed.

a. 

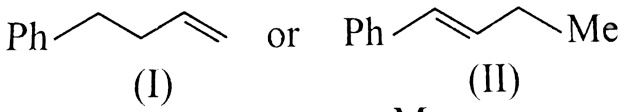
b. 

c. 

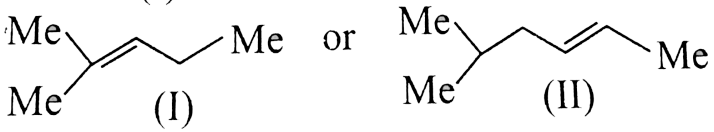
d. 

e. 

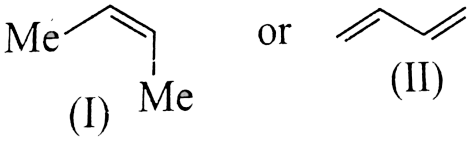
XII. Which hydrolyses at faster rate?

a. 

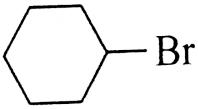
(I) (II)

b. 

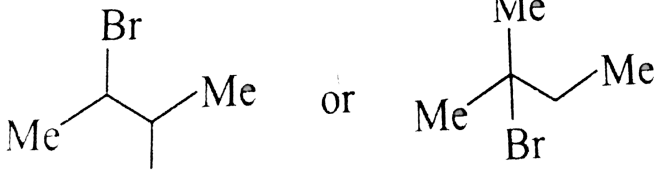
(I) (II)

c. 

(I) (II)

a. PhBr or 

(I) (II)

b. 

(I) (II)

c. 

(I) (II)

View Text Solution

16. A Grignard regane t($A0$ and a haloalkene (B) react together to give (C) compound (C) on heating with KOH yields a mixture of two geometrical isomers, (D) and (E) of which (D) predominates. (C) gives 1 - bromo 3 - phenyl propane on reaction with Hbr in the presence of a peroxide. Give teh structures of (A), (B), and (C) and the configuratins of (D) and (E).

Watch Video Solution

17. Cataylitc dehydrogention of methylcyclohexxane, obtained form petroleum, gives a liquid which on treatement with chlorosulphonic acid at $370K$ yileds a mixture of two isomers (A) and (B), $C_7H_7SO_2CL$. The major isomer (A) reacts with ammonia to from (C), which on oxidation with permangnate gives compound (D) gives a well-known sweet-ening agent. (E). The major isomer (B) also reacts wtih ammonia to give a compound (F) which on treatment with $NaCl\frac{\varnothing}{N}aOH$ gives an antiseptic (G). Idntify (A) to (G).

View Text Solution

18. An organic compound (A) on analysis was found to contain $C = 16.271\,\%$, $H = 0.677\,\%$, and $Cl = 72.203\,\%$. It reduced Fethyng's solution and on oxidation gave a monocarboxylic acid (B), having $C = 14.679\,\%$, $H = 0.612\,\%$, and $Cl = 65.137\,\%$. On distillation with sda lime. (B) gave a sweet-smelling liquid (C), containng $89.12\,\%$ chlorine . (C) can alos be obtained by heating (A) with alkali. What structural fornuate would you assign to (A), (B), and (C)?

Explain the above reactions:.

View Text Solution

19. Benzene reacts with CH_3I in the presence of $AlCl_3$ to give compound $(A)\left(C_7H_8\right)$ which undergas oxidation with alkaline $KMnO_4$ to give an acidic compound (B). (B) reacts with $SOCl_2$ to give (C) which gives (D) with ammonia. The compound (D) on reaction with bromine and alkali froms (E) which reacts with bromnine water to give $(F)\left(C_6H_4NBr_3\right)$. (F) reacts with $NaNO_2$ adn HCl and forms $(G)\left(C_6H_2N_2Br_3Cl\right)$. Additiaon of Kl froms (H) Indenitify the compounds (A) to (H).

Watch Video Solution

20. Two isomeric mononitro derivaters (B) and (C) are obtained by the nirtration of an organic compound (A), C_7H_8O. Treatment of $(A0$ with acetyl chloride products (D) which on reaction with CrO_2Cl_2 gives (E) whose oxidation with neutral $KMnO_4$ followed by acidification gives (F). Compound (F) on heating gives pheonl. (A) on treatment with alkaline $C_6H_5SO_2Cl$ produces. (A) on treatment with alkaline $C_6H_5SO_2Cl$ produces (G) which on oxidiation with $KMnO_4$ gives (H). Hydrolysis of (H) also gives (F). Give teh structures of (A) to (H).

View Text Solution

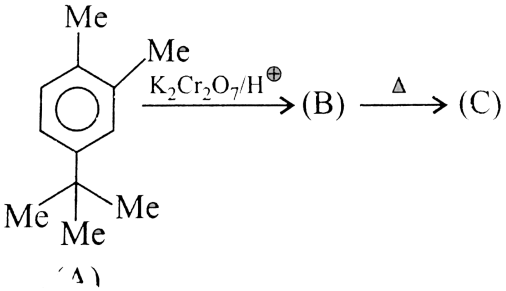
21. An organic compound $(A)\left(C_9H_{12}\right)$ gave $(B)\left(C_8H_6O_4\right)$ on oxidation by alkaline $KMnO_4(B)$ on heating does not from anhydride. Also , (B) reacts with Br_2 in the presence of iron to give only one monobromo-derivative $(C)\left(C_8H_5BrO_4\right)$. WHat are (A), (B), and (D) ?

View Text Solution

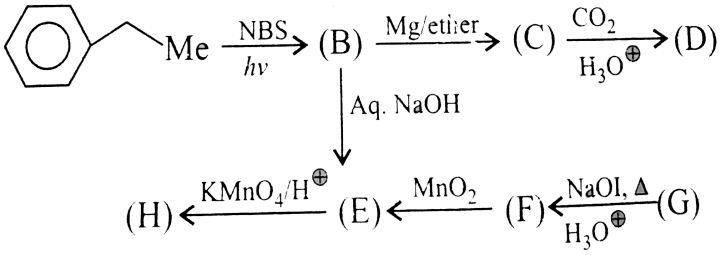
Solved Problems

1. Complete the following reactions:

a.



b.



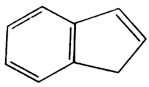
c. Benzene + CH_2N_2 $\xrightarrow{hv}$ (A) $\xrightarrow{H_2/Pt}$ (B)

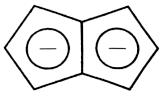
View Text Solution

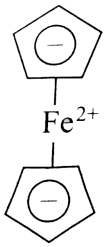
2. Cycloocta -$1, 3, 5, 7$ - tetrane (A), a non-armatic compound reacts with 2 mol potassium to from a stable compound (B) without producing. H_2. Write the structure of (B) and explain the reason for its stability.

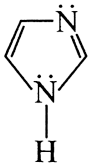
View Text Solution

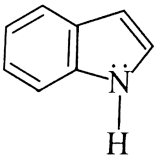
3. Select the aromatic, anti-aromatic, and non-aromatic compounds.

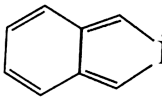
a.  (Indene)

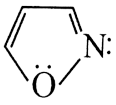
b. 

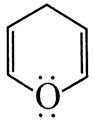
c.  (Ferrocene)

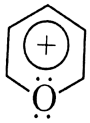
d.  (Imidazole)

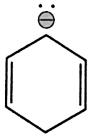
e.  (Indole)

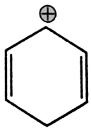
f.  (Isoindole)

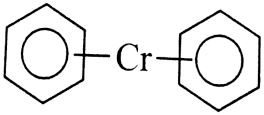
g. 

h.  (Pyran)

i. 

j. 

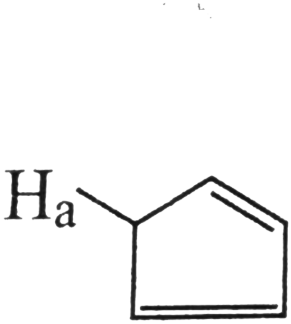
k. 

l.  (Dibenzene chromium)

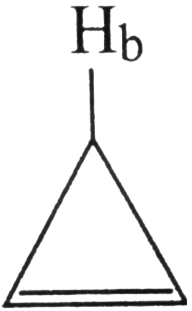
View Text Solution

4. Answer the following :

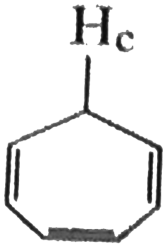
a. Which of the following H will have lower pK_a value in the given compound?



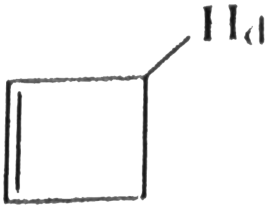
(I)



(II)

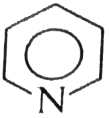
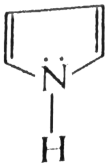


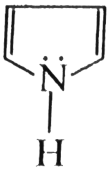
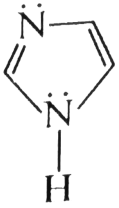
(III)



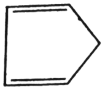
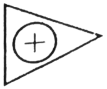
(IV)

b. Which of the following have lower pk_b value?

i.  (Pyridine) and  (Pyrrole)

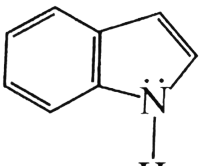
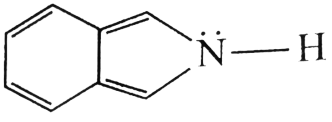
ii.  (Pyrrole) and  (Imidazole)

c. Give the decreasing order of teh stability of the following:

i.  (I)  (II)  (III)

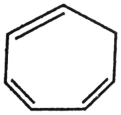
ii. C_9H_{10} (I) $\overset{\oplus}{C}_9H_9$ (II) $\overset{\ominus}{C}_9H_9$ (III)

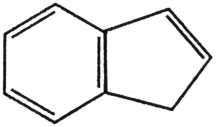
d. Which of the following is more stable?

 Indole (I) and  Isoindole (II)

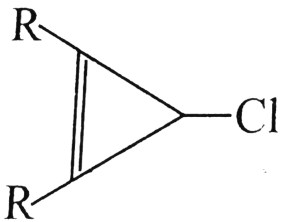
e. What of the decreasing order of pk_a values of the following?

I. $HC = CH$

II. 

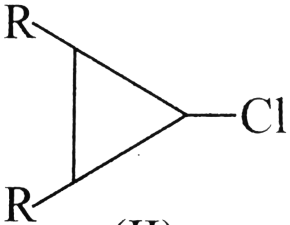
III. 

f. Which of the following has highest K_a value?

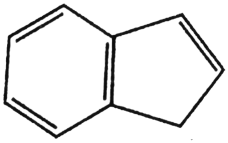
i. 

(I)

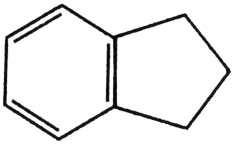
or



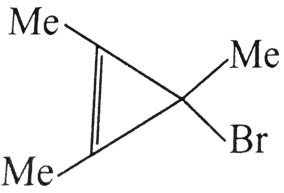
(II)

ii. 
(I)

or

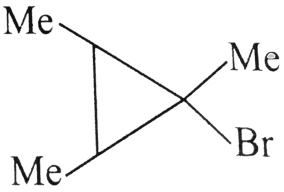

(II)

g. Which of the following reacts faster wtih ag. $NaOH$ by SN^{-1} mechanis,?



(I)

or



(II)

View Text Solution

5. Distinguish chemically between the following:

i. (a) Cyclohexane, (b) Cyclohexane, (c) Benzene

ii. (a) Benzene, (b) Naphthalene

iii. (a) Anthrance and (b) Phenanthrene.

View Text Solution

6. Expalin the following observations:

a. Benzene is soluble in water whiel both $1,3$ - and $1,4$ - cyclohexadiene are insouble.

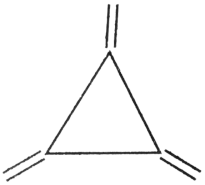
b. Melting point of benzene $(32K)$ is much higher than both $1,3$ - and $1,4$ - cyhexadiences.

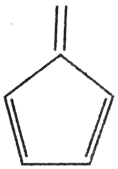
c. P - Xylene has higher metling point than o - and m - xylenes.

Watch Video Solution

7. Some alternate strucres proposed for benzene are given. Indicate for each of them how many (i) mono and (ii) di-substuted products are

possible. Which structures fits in the isomer number observed for

i. 

ii. 

iii. $HC\equiv C-CH_2-C\equiv C-CH_3$

iv. $HC\equiv C-C\equiv C-CH_2-CH_3$

v. $HC\equiv C-CH_2-CH_2-C\equiv CH.$

benzen?

iii. $HC \equiv C - CH_2 - C \equiv C - CH_2$

iv. $HC \equiv C - C \equiv C - CH_2 - CH_3$

v. $HC \equiv C - CH_2 - CH_2 - C \equiv CH.$

View Text Solution

8. Arrange the following in decreasing order of $\left(\frac{m}{o+p}\right)$ ratio.

a. I. $PhCH_3$, II. $PhCBr_3$

III. $PhCHBr_2$, IV. $PhCH_2Br$

b. I. $PhCH_3$, II. $PhCBr_3$

III. $Ph\mathbb{C}l_3$, IV. $PhCl_3$

c. I. $ArN^{\oplus}R_3$, II. $ArCH_2N^{\oplus}R_3$

III. $ArCH_2CH_2N^{\oplus}R_3$

View Text Solution

9. Give the principal product on bromination with $Br_2/FeBr_3$ of the following.

I. Ph - $OCOR$, II. Ph - $CH = CH$ - NO_2

III. $PhCOONH_2$, IV. Ph - O - Ph

V. $PhCH_2OH$, VI. $PhCoEt$

VII. Ph - $CH = CH$ - $COOH$

View Text Solution

10. Give the decreasing order of $\left(\frac{o+p}{m}\right)$ ratio for the nitration of compounds in Problem 11.9.

View Text Solution

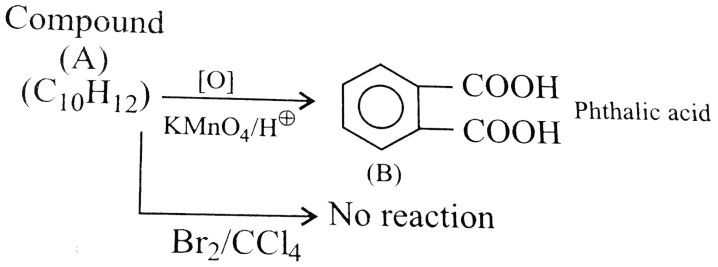
11. Give major products of the following:

View Text Solution

12. Give the decreasing order of $\frac{\oplus p}{m}$ ratio of the reactions or decreasing order of the reactivity given is problem 11.11.

View Text Solution

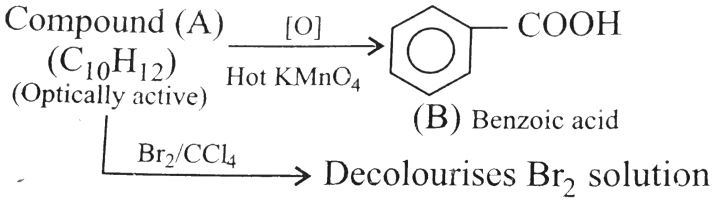
13.



Identify compound (A) How many isomers including geometrical isomers are possible for (A) ?

Watch Video Solution

14. Identify (A).



Watch Video Solution

15. Give the products of the following:

i. Benzene + Cylohexanol $\left(BF_3, 60^\circ C\right)$

ii. Benzene $+CH_2 = CHCH_2Cl\left(ZnCl_2\right)$ and H_2SO_4

iii. Benzene + Ethylene oxide $+AlCk_3$

iv. Benzene $+CH_2Cl_2 + alCl_3 \rightarrow (A)$

$C_6H_6+AlCl_3$ |
$(B) \quad \leftarrow$

v. Benzene $+ClCH_2CH_2Cl + AlCl_3 \rightarrow (C)$

$C_6H_6+AlCl_3$ |
$(D) \quad \leftarrow$

vi. Benzene + Phosgene $\left(COCl_2\right) \overset{AlCl_3}{\rightarrow} (E)$

overset(H_(3)O^(o+))(rarr) (F)*vii. Toe* ≠ + *Maloncianthydride*

overset(AlCL_(5))(rarr) (A)underset(H_(3)PO_(4))(rarr) (B) underset(HCl)

overset(Zn-Hg)(rarr) (C)

viii. Expla ∈ *howalkylbenze* ≠ *napha* ≤ ≠ , *anthrace* ≠ and *phenanthre* ≠ *canbe*

F.C.` reaction ?

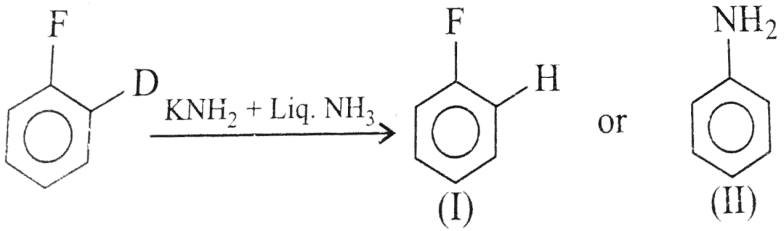
View Text Solution

16. a. Show that reaction of o - bromogluro benzene with Mg produces benzyene.

b. Why does I - cj,prp-2.6 - dimerhyl benzene not undergo elimination-addition reaction with $NaNH_2$ in liq. HN_3?

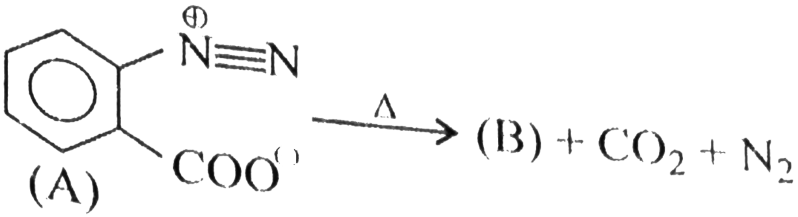
c. Why does bromobenzyene react faster than 2.6 - dideuteriobromonbenzene with $NaNH_2$ in liw. NH_3?

In the following reactions:



Explain why the formaiton of (I) is faster than that of (II).

c. Why does compound (A) on heating give benzyene intermediate which dimeries to give product (B).



View Text Solution

17. When three isomeric chlorotounes are treated with KNH_2 in liquid NH_3, they yield different toluidines as shown below. Explain these observations. ltrgt a. o - Chlorotouene $\rightarrow$ $(o:m)$ - Toluidine

b. m - Chlorotouene $\rightarrow$ $(o+m+p)$ - Touidine

c. p - Chlorotouene $\rightarrow$ $(m+p)$ - Touidine

View Text Solution

18. Give the order of reactivity towards SN^2 reaction of the followig:

a. i. 1 - Bromopentane

ii. 2 - Bromopenatane

iii. 2 - Bromo -2 methyl butane

b. i. n - Butybromide $\left(C_4H_9Br\right)$

ii. Isobutyl bromide Me_2CHCH_2Br

iii. sec - Buityl bromnide CH_3 - $CH(Me)CH_2Br$

iv. tert- Butyl bromide Me_2C - Br

View Text Solution

19. Give the order of reactivity towards SN^1 reaction of the followig:

a. i. 1 - Bromopentane

ii. 2 - Bromopenatane

iii. 2 - Bromo -2 methyl butane

Watch Video Solution

20. Give the order of SN^{-1} of SN^{-1} and SN^2 displacement of halogen $CH_3X, 1^{\circ}X, 2^{\circ}X, 3^{\circ}X$.

Watch Video Solution

21. Give the order of reactivity towards $E2$ dehydrohalo-genation of the following.

a. i. C_2H_5Br

ii. C_3H_7Br

iii. Isobutyl bormide

iv. Neopentyl bromide

b. i. 2 - Bromo - 2 - methybutane

ii. 1 - Bromo pentane

iii. 2 - Bromo pentane

iv. 3 - Bromo pentane

Watch Video Solution

22. Give the order of reactivity towards SN^{-1} solvoloysis of the following:

i. Benzyl chloride

ii. p - Chlorobenzyl chloride

iii. p - Methoxbenzyl chloride iv. p - Methyl benzyl chloride

v. p - Nitrobenzyl chloride

Watch Video Solution

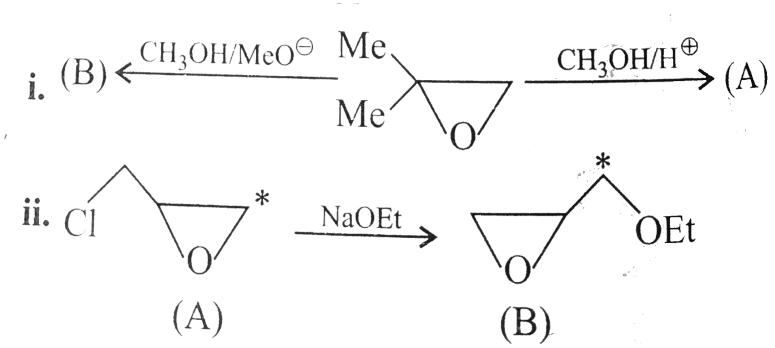
23. Give the order of reactivityh towards SN^1 reaction of the following:

i. $ClCH_2CH = CH_2$

ii. $CH_3CH_2CH_2Cl$

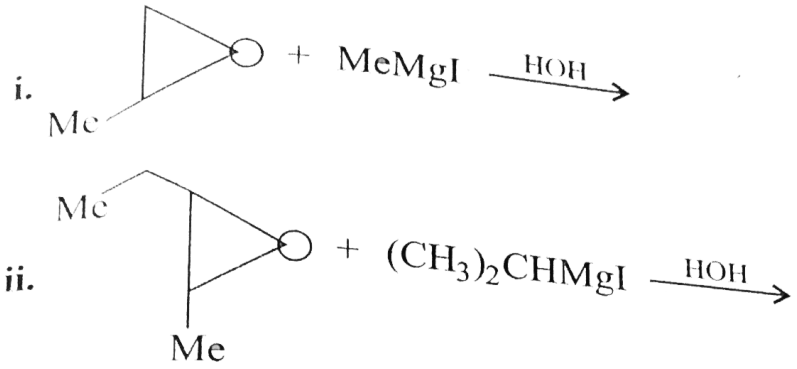
iii. $CH_3CH = CHCl$

Watch Video Solution



24.

View Text Solution



25.

View Text Solution

26. Outline the preparationof the following compounds using a nucliphileic subsituationr reaction.

a. $CH_3OC\left(CH_3\right)_3$

b. $CH_3C \equiv \mathbb{C}H_2CH_3$

c. $CH_3CH_2CH_2N\left(CH_3\right)_2$

d. $C_6H_5CH_2OCOCH_3$

e. $CH_3CH_2CH_2CH_2NO_2$

f. $CH_3CH_2CH_2Cn$

g. $C_6H_5CH_2N^{\oplus} \equiv C^{o-}$

h. $CH_3CH_2 - O - N = 0$

View Text Solution

27. Which compound in each of the following paris will react faster in SN^2 reaction with HO^{o-} ?

a. CH_(3)Br or CH_(3)I*b*. (CH_(3))_(3)CCl or CH_(3)Cl*c*. CH_(2) = CHBr or CH_(2) = CH - CH_(2)Br`

Watch Video Solution

28. Arrange the folliwing compounds in increasing order of SN^{-2} reactivity.

a. I.m $ClCH_2CH = CHCH_2CH_3$

II. $CH_3C(Cl) = CHCH_2CH_3$

III. $CH_3CH = CHCH_2CH_2Cl$

IV. $CH_3CH = CHCH_2(Cl)CH_3$

b. I. CH_3CH_2Br

II. $CH_2 = CHCH(Br)CH_3$

III. $CH_2 = CHBr$

IV. $CH_3CH(Br)CH_3$

C. I. $\left(CH_3\right)_3\mathbb{C}l$, II. $C_6H_5C\left(CH_3\right)_2Cl$

III. $\left(CH_3\right)_2CHCl$, IV. $CH_3CH_2CH_2Cl$

Watch Video Solution

29. Predict all the alkenes that would be formed by dehydrohalogenation of the following halides with sodium ehoxide in ethanol and indentify

major alkene.

a. I - Bromo - 1 - mehylecyclohexane

b. Chcolhexylmethyl bromide

c. 2 - Chloro - 2 - ilutane

d. 3 - Bromopent 1 - ene

e. $2, 2, 3$ - Trimethyl 3 - bromopentane.

Watch Video Solution

30. Predict all order of reactivity of the following compounds in dehydrohalogenation.

a,. I. $CH_3CH_2CH_2CH_2Cl$

II. $\left(CH_3\right)_2CHCH_2Cl$

III. $\left(CH_3\right)_2CH - CH_2Br$

IV. $CH_3CH(Br)CH_2CH_3$

V. $\left(CH_3\right)_3C - Br$

b. I. $CH_3CH(Br)CH_3$

II. $CH_3CH_2CH_2Br$

III. $\left(CH_3\right)_2CH$ - CH_2Br

IV. $\left(CH_3\right)_3C$ - CH_2Br

View Text Solution

31. Explain :

a. Vinyl chloride is unreactive in nucliphillic 4 - subsitution reactions.

b. Neopenthyl bromide undergoes nucliphillic substituion reactions very slowly.

c. 3 - Bromocyclohexane is more reactive than 4 - bromovyclohexane in hydrolysis with aqueous $NaOH$.

d. *ter* - Butyl chloride reacts with aqueous sodium hydroxide by SN^1 mechanishm while *n* - butuyl chloride reacts by SN^2 medchanism.

View Text Solution

32. The nucliphilic substituation of primary alkyl chlorides wityh sodium acetate is cataysed by sodium iodide. Explain why.

Watch Video Solution

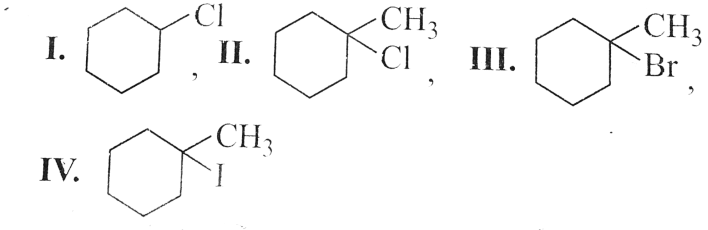
33. Arrange the folliwing halides in order of increasing SN^2 and SN^1 reactions.

I. CH_3Cl , II. CH_3Br

III. CH_3CH_2Cl , IV. $\left(CH_3\right)_2CHCl$

Watch Video Solution

34. Predicrt the order of reactivity of the following compounds in SN^1 and SN^2 reactions.



Watch Video Solution

35. Predict the order of reactivity of the folloiwing compoundss in SN^1 and SN^2 reacations.

a. The four isomeric bromolbutanes

b. I. $C_6H_5CH_2Br$

II. $C_6H_5CH\left(C_6H_5\right)Br$

III. $C_6H_5CH\left(CH_3Br\right.$

IV. $C_6H_5C\left(CH_3\left(C_6H_5\right)Br\right.$

View Text Solution

36. Identify all the possible alkenes that would be formed on the dehydrohalogenation of the following organic halides with alcoholic KOH. Also, identify the major alkene.

a. 1- Chloropentane

b. 2- Chloropentane

c. 2-chloro-2-methyl butane

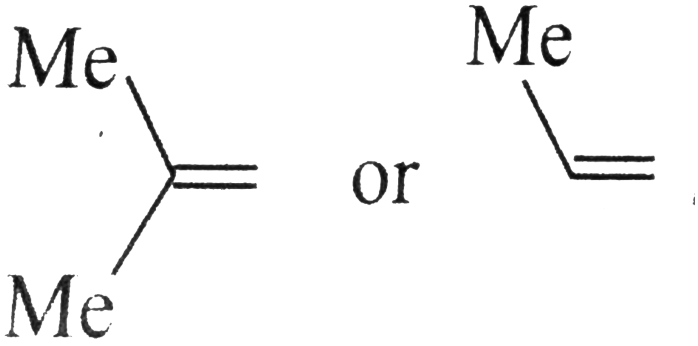
d. 2-Chloro-3-methyl butane

e. 3- Chloro-2-methyl pentane

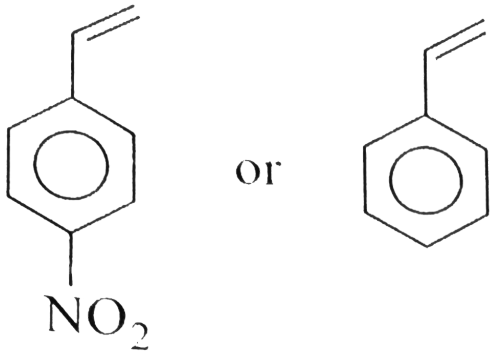
Watch Video Solution

37. I. Which compound has the fasterct rate of reaction with HCl ?

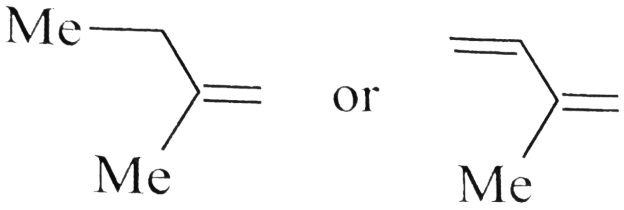
a.



b.



c.



II. Two compounds $\left(C_8H_{15}Br\right)$ are formed when 1.6 - dimethycycothexene reacts with HBr in dark and are formed from 1.2 - dimethylcyclohexene. What are these two compounds?

III. A hydrocarbon $(Mw = 70)$ gave only on monochloro-derivatives on photochemical chlorination. Name both the compound.

IV. Among the isomerc alkanes of $MF\left(C_5H_{12}\right)$ identify the one that on photochemical chlorination yields:

a. A single monochloride

b. Three isomeric derivaties

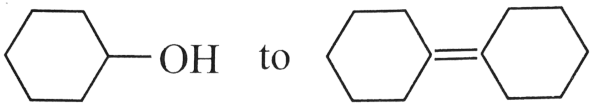
c. Four isomeric derivaties

View Text Solution

Exercises Subjective Type

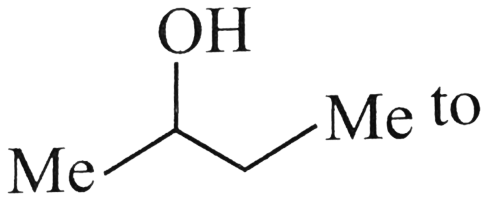
1. Synthesise the following:

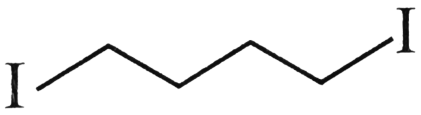
i. Propane to a. 1 - fluroopropane, b. cyclopropane, and c. 2.3 - dunethl butane

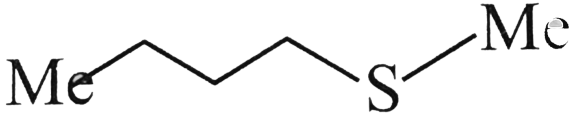
ii. 

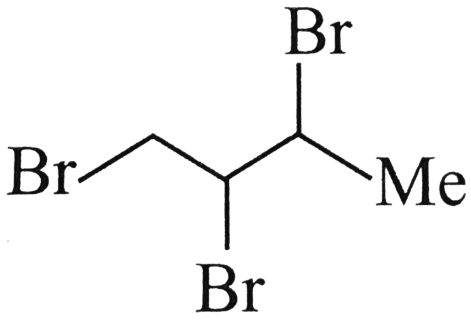
ii.

iii. C_2H_5Br to but -1 - ene

iv. 

a. 

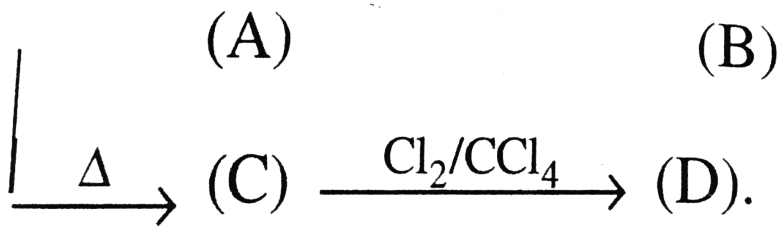
b. 

c. 

iv.

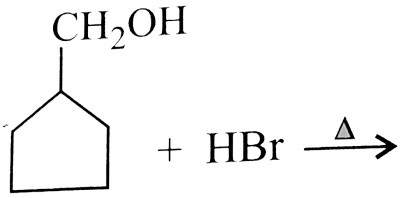
v. CYclopetane ro hexachloropentadience

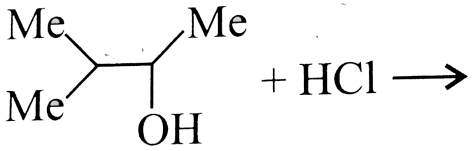
(vi) Cyclopentadiene + Hexachlorocyclopentadiene

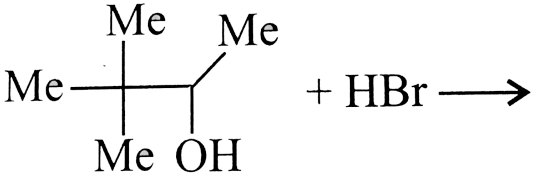


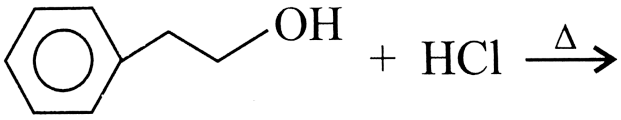
View Text Solution

2. (i) Identify the major and minor products.

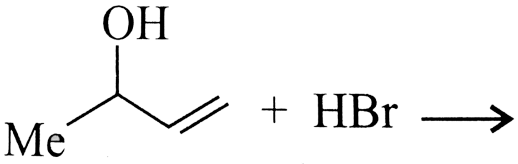
a. 

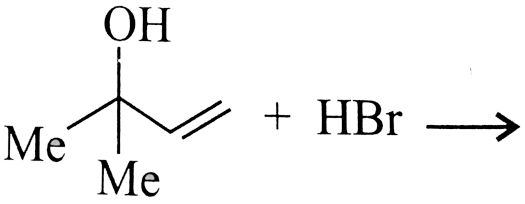
b. 

c. 

d. 

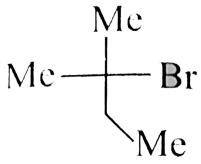
e. 

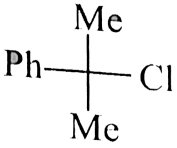
f. 

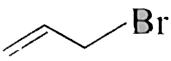
g. 

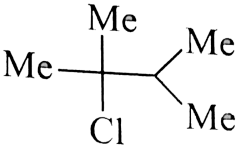
*h*1-*Butanol*+ HBr rarr*i*. 2-*Butanol*+ HBr rarr`

ii. Suggest the reagenet that could be used to preapare these alkyl haliders form alcholos.

a. 

b. 

c. 

d. 

iii. Idenitify the products in the following reactions:

(##KSV_CHM_ORG_P2_C11_E01_003_Q03.png" width="80%"> iv. Idenitify (*A*), (*B*), (*C*) and (*D*) in the following:

(##KSV_CHM_ORG_P2_C11_E01_003_Q04.png" width="80%">

v. Idenitfy the products in the following reaction:

(##KSV_CHM_ORG_P2_C11_E01_003_Q05.png" width="80%">

vi, Idendify the products when (*A*) reacts with:

(##KSV_CHM_ORG_P2_C11_E01_003_Q06.png" width="80%">

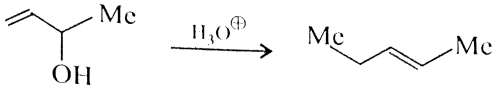
a. Br_2/Fe , b. $Br_2/\mathbb{C}l_4$

c. *NBS* , d. *HBr*

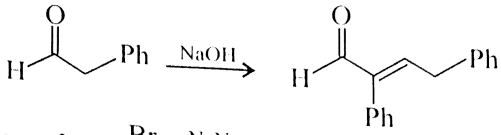
View Text Solution

3. i. Classify the following reactions as an addition elimination substituation condensation rerrangement geometrical isomerisation, or oxidation/reduction.

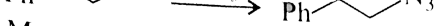
a.



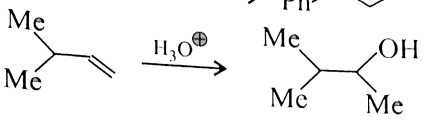
b.



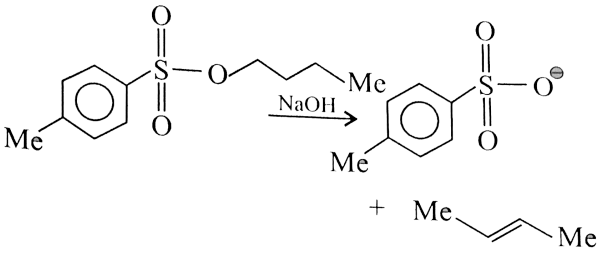
c.



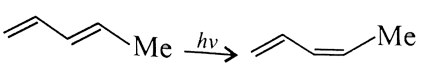
d.



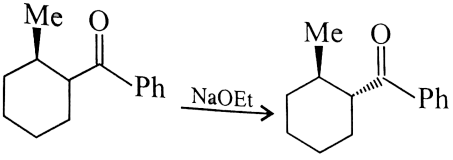
e.



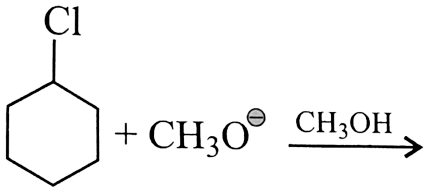
f.

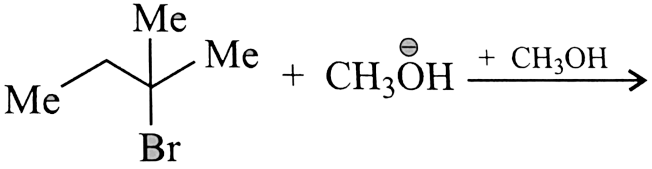


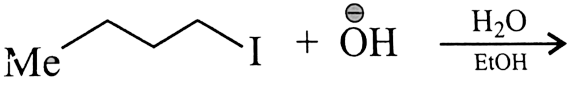
g.



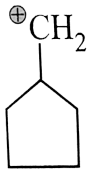
ii. Show both substition and elmination products in these reactions.

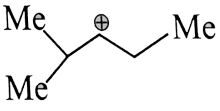
a. 

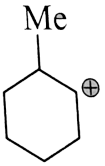
b. 

c. 

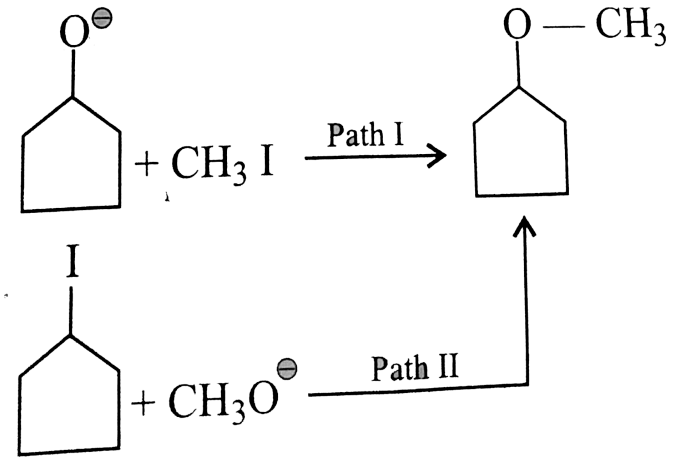
iii. SHow the rearranged carbocations that are expected form these carbocations.

a. 

b. 

c. 

iv. WHich path is better for the reaction ?



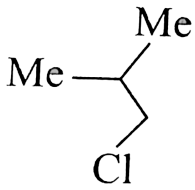
View Text Solution

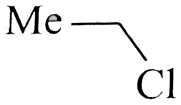
4. i. sec-Butyl alcohol will undergo alkaline hydrolysis in the polar servent by

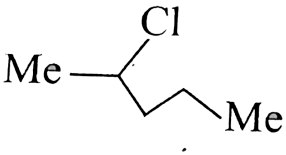
a. SN^2 , b. SN^(1)*c*. SN^(1) and SN^(2) , *d*. *No* ≠ *ii*. *Whichofthefollow* ∈ *gstatementsisc* or *rect*? (A) overset(Aq. KOH)(larr) C_(2)H_(5) Br overset(Alc. KOH)(rarr) (B)*a*. (A) *isobta* ∈ *edbye* lim ∈ *ationreaction*. *b*. (B) *isobta* ∈ *edby* ⊂ *stitutionreaction*. *c*. (A)*is*C_(2) H_(6)*whi* ≤ (B)*is*C_(2)H_(6)O

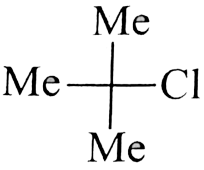
. *d*. (A)*isisomerof* dim *enthyether*(B)*isdehydratedcompoundof*(A)

. *iii*. *WHichofthefollow* ∈ *gwillundergo*SN^(2)` readiluy?

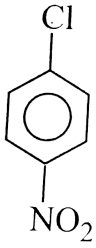
a. 

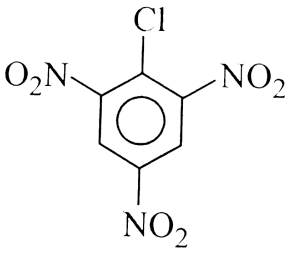
b. 

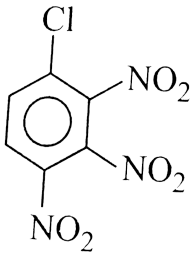
c. 

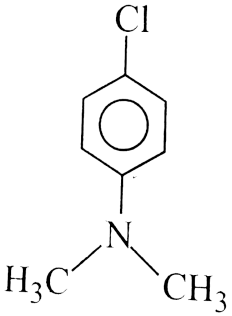
d. 

iv. Which of the following will undergo hydrolsis most readily with aq. *KOH* ?

a. 

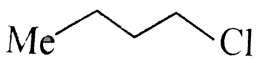
b. 

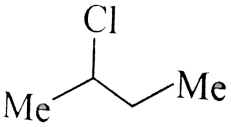
c. 

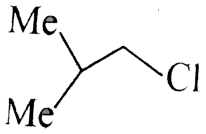
d. 

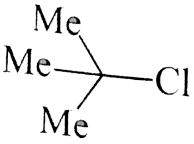
V. In tow experiments equal quantities of an alkyl halide, $\left(C_4H_9Cl\right)$ were

treated at the same temperature with equal voluemes of $0.1M$ and $0.2M$ solution of $NaOH$, respectively. In the two experiments the time taken for the reaction of exactly $50\,\%$ of the alkyl halide was the same. THe most likely structures of the halides is:

a. 

b. 

c. 

d. 

vi. Which of the following methods is not suitable for the preaparation of RX ?

a. Halogentaion of alkane

b. ROH and PX_3

c. ROH and HX

d. Alkene and HX

vii. The heterlyic bond dissociation energy of the $(C\text{ - }Cl)$ bond ib vinyl chloride is 207 kcal mol^{-1} as compared to $191 kcal mol^{-1}$ in the case of $(C\text{ - }Cl)$ bond in C_2H_5Cl. One explainion for this observation is:

a In C_2JHl the bond energy is decreased through resonace involving lone

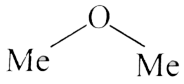
pair of $\bar{e}'s$ on chlorine.

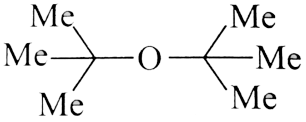
b. The hyperconjugation stabilsation in C_2H_5Cl.

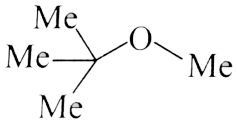
c. In vinyl chloride, $(C - Cl)$ bond gets partial double bond character through resonance.

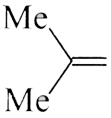
d. In vinyl chloride the Cl atom is attached to sp - hybridised C, whereas in C_2H_5Cl it is attached to sp^3-hybridsed C atom.

viii. When $\left(Me_3C - Cl\right)$ is reached with $NaOMe$ the major product is

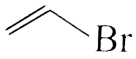
a. 

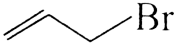
b. 

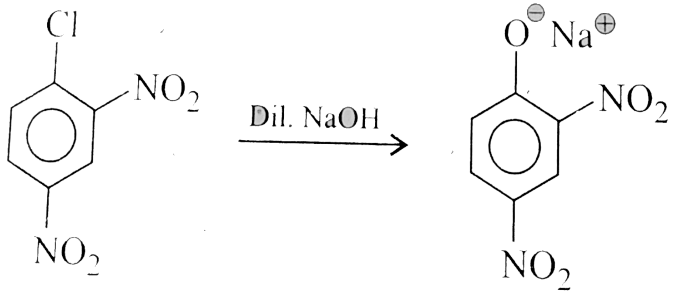
c. 

d. 

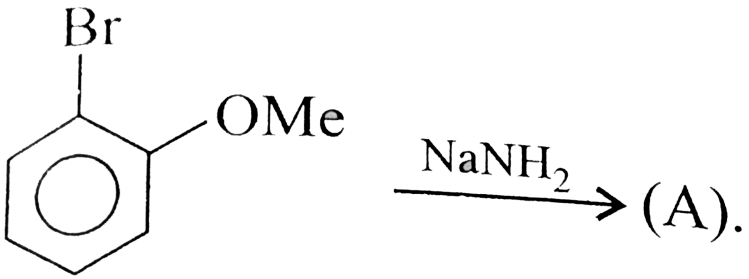
ix. Which of the following would be hydrolsed most readily?

c. 

d. 



x.



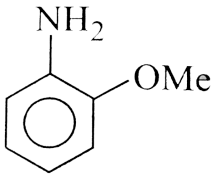
The above reaction proceeds rhrough:

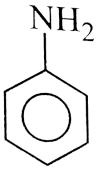
a. Electrophilic additon

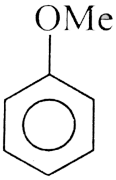
b. Benzyne intermediate

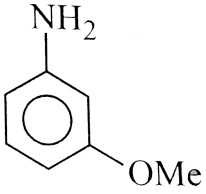
c. Activated nucleophilic substitution

d. Oxirane

a. 

b. 

c. 

d. 

xi.

View Text Solution

Exercises Subjective

1. Give the chemical test to distinguish between

(a) Hexane (I), $MeCH = CHCl(II)$,

Propylchloride (III), and $CH_2 = CHCH_2Cl(IV)$

(b) $(V)CH_3Cl$, (VI) CH_(3)Br, and (VII) CH_(3)I`

View Text Solution

2. Give the product of $E2$ reaction of the following compounds with atc. KOH.

a. Ertho-and therno form of I - bromo 1.2 - diphenyl propane

b. Eryhgro- and thero-from of $2, 2, 3, 5, 5$ - penta methyl 4 - bromo hexane

View Text Solution

3. Draw the diastermers of 2 - chloro -$1,3$ - dimethyl cyclohexane and indicate the diasteromers that cannot undergo $E2$ elimination and give the product from these that react.

View Text Solution

4. Draw the diastermers of 2 - chloro -$1,3$ - dimethyl cyclohexane and indicate the diasteromers that cannot undergo $E2$ elimination and give the product from these that react.

View Text Solution

5. (W) and (X) are optically active isomers of C_5H_9Cl (W) on treatment with $1mol$ of H_2 is converted to an optically inactive compound (Y), but (X) gives an optically actgive compound (Z) under the same conditions. Give the sturcture of (Y) and the configurations of $(W), (X)$ and (Z) in Fischer projections.

View Text Solution

6. An organic compound (A), $C_8H_4O_3$ in dry benzene in the presene of anhydorus $AlCl_3$ gives compound (B). Compound (B) on treatment with PCl_5 followed by reaction with $H_2/Pd\left(BaSO_4\right)$ gives compound (C) which on reaction with hydrazine gives a cyclised compound (D), $\left(C_{14}H_{10}N_2\right)$ Idenyify (A), (B), (C) and (D). Explain the formation of (D) from (C).

View Text Solution

7. Three isomeric hydrocations $C_9H_{12}\begin{bmatrix}A\\B\\C\end{bmatrix}$ oxide to $C_9H_6O_6\begin{bmatrix}D\\E\\F\end{bmatrix}$ while (D) may give three different monoethyl esters, (E) may from only two and (F) only one. Idenity compounds (A) to (F).

View Text Solution

8. An organtiic compound (A) contains $C = 92.3\,\%$ and $H = 7.7\,\%$ Its vapour density has been found to be $52.$ (A) is oxidised by $KMnO_4$ soltuion in cold and when fully oxidised gives an acid (B) which contains $C = 68.8\,\%$ and $H = 4.9\,\%$ (A) reacts with bromic and yields a comnpound (C) containing $60.8\,\%$ bromine. What is the structer of (A) ?

View Text Solution

9. An aromatic hydrocarbobn (A) containing $C = 91.3\,\%$ and $H = 8.7\,\%$ on treatment with chlorine gave there isomeric monochloro compound (X), (Y) and (Z), each having $28\,\%$ chlorine . On oxidation with $KMnO_4$ all the three gave mononbasic acids. The acid form (X) on distillation with soda line gave benzene while those form (Y) and (Z) gave monochiorobenzene. What formula would you assign to the various comnpounds?

View Text Solution

10. Compound $C_8H_9Cl(A)$ on treatment with $KICN$ followedd by hydrolysis gives $C_9H_{10}O_2(B)$. Ammonium salt of (B) on dry disillation yiels (C), wyhich reacts with alkene solution of bromnine to give $C_8H_{141}N(D)$. Another compound $C_8H_{10}O(E)$ is obtained by the actions by the action of nitrous acid of (D) or by the action of aqueosu potacsh on (A), (E) on oxidation gives the inner anthydide $C_8H_6O_4(F)$ which gaves the inner anthdride $C_8H_4O_3(G)$ on heating Identify the various compounds (A) to (G).

View Text Solution

11. ON disuphonatioon followed by fusion with $NaOH$ an dacidificant, an aromatic compound $C_8H_{10}(A)$ gives two isomeric comnpounds (B) and (C) (molecular formula $C_8H_{10}O_2$. Oxidation of esters of (B) and (C) followed by hydrolysis gives two isomers comnpounds (D) and $(E)\left(C_7H_6O_4\right)$ which may be decarboxylated to form $C_6H_6O_2(F)$. Identigy compounds (A) to (F).

View Text Solution

12. The compoiund $(A0$ is xylene. On sulphonation, it gives only one product (B) which on alkaine fusion followed by acidification yields (C), a phenol. On treatment with chlorform and alkali, (C) gives $C_9H_1O_2(D)$. Idenifuy the various organic compounds (A) to (D).

View Text Solution

13. An organci compound $C_6H_4O_2NCl(A)$ reacts with a,la,oo tp gove $C_6H_5O_3N(B)$. On reduction with tin and $HCl, (B)$ gives $C_6H_7ON(C)$ whereas on milder reduction it gives $(D)C_6H_7O_2N$, which rearranges in the presence of a mineral acid to give a new compound (E). Identify the various compounds from (A), to (E).

View Text Solution

14. A hydrocarbon $C_9H_{10}(A)$ rapidly decolourises cold aquous permanganate and rapidly absorts one molecule of bromine . Vigous

hydrogenation of (A) gives a compound (A) gives a compound (B) of the formula C_9H_{18}. Strong oxidation of (A) yileds phyalic acid. Propose a structure for (A) and give the basic for your answer.

Watch Video Solution

15. On nuclear chlorination, $C_8, H_{10}(A)$ gives a product (B) which may be oxidised to $C_8H_5O_4Cl(C).(A)$ may alos be chlorinated to give $C_8H_8Cl_2(D), C_8H_6Cl_4(E)$, and $C_8H_4Cl_6(F).(D),(E)$ and (F) on hydrolysis give halogen-free compounds $(G),(H)$, and (I), respectively. With $CrCO_2Cl_2,(A)$ gives $C_8H_6O_4$ which is identiacla with (I) . Identify wtih (I). Identify the varioius compounds (A) to (J).

Watch Video Solution

16. When boromobenze is monochlorinated. Two ismoeic compounds (A) and (B) are obtained. Monobromination of (A) gives several isomeric products of molecular formula $C_6H_3ClBr_2$. While mononbromination of (B) yields only two isomers (C) and (D). Compound (C) is identiacla to

one of the compounds obtained from the bromination of (A). However, (D) is totally different form any of the isomeric compounds obtained from the bromination of (A). Give the sturctures of (A), (B), (C) and (D), and also the structers of the four isomeric mononbrominated products of (A). Support your answer wtih resoning.

Watch Video Solution

17. $0.450gm$ of an aromatic organic compound (A) on ignitin gives $0.905gmCO_2$ and $0.15gmH_2O0.350gm$ of (A) on hydrolysis with $Ca(OH)_2$ yields (B) which on mild reduction gives an optically active compound (C). On heating (C) with I_2 and $NaOH$, iodofrom is produced along with (D). With HCl, (D) gives a solid, which is more soluble in hot water than in cold. Idenify (A) to (D) with proper explanaion.

View Text Solution

Exercises Concept Application Type

1. In each of the following reactions, a new ring is formed. Use curved arrow notation to explain the formation of the new ring.

a. $1,4$ - Dibromobutance $(0.1mol)$ is treated with sodiuk suplhile $(0.1mol)$ in aqueous ethabnol.

b. 1 - Choloro - 2 (2 - hyddroxyphenyl) ethane is treated with aquencous sodium hydroxide.

c. o - Methoxybenyl bromide reacts faster than p - nitrobenyzl bromide with ethanol to form an ether product. Explain why.

d. Explain the formation of the two products in the following reactions:

$$CH_3CH{=}CHCH_2Cl + H_2O \rightarrow$$
$$CH_3CH{=}CHCH_2OH + CH_3CH(OH)CH{=}CH_2$$

e. What mass of propene obtained from $34.0gm$ of I - iodopropane on heating with ethanolic KOH, if the yield is $36\ \%$?

f. The nucleophilic substitution of primary alkyl chlorides with sodium acated acetate is catalysed by sodium iodide. Explain why.

View Text Solution

2. Write the structure of the major organic product in each of the following reactions:

a. $CH_3CH_2CH_2Cl + NaI \xrightarrow[\text{Heat}]{\text{Accetone}}$

b. $(CH_3)_3CBr + KOH \xrightarrow[\text{Heat}]{\text{Ethanol}}$

c. $CH_3CH(Br)CH_2CH_3 + NaOH \xrightarrow{\text{Water}}$

d. $CH_3CH(Br)CH_2Br + KCN \xrightarrow{\text{Aq. ethanol}}$

e. $(CH_3)_3CBr + H_2O \xrightarrow[\text{Heat}]{}$

f. $(CH_3)_2CH - CH(Br)CH_2CH_3 \xrightarrow[\text{Ethanol//Heat}]{C_2H_5ONa}$

g. $CH_3CH_2Cl + SbF_3 \xrightarrow[\text{Heat}]{}$

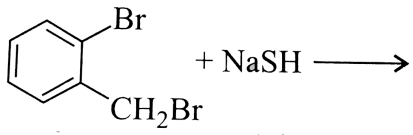
h. $CH_2 = CHCH_2Br + CH_3C \equiv CNa \xrightarrow{\text{Liq. } NH_3}$

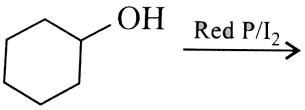
i. $C_6H_5CH_2Cl + C_2H_5ONa \rightarrow$

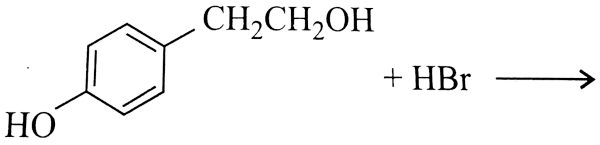
j. $CH_3CH_2CH_2OH + SOCl_2 \rightarrow$

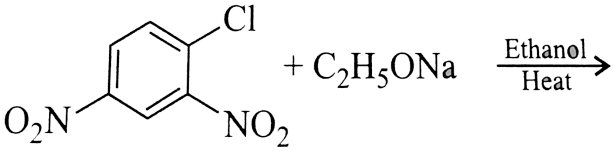
k. $CH_3CH_2CH = CH_2 + HBr \xrightarrow{\text{Peroxide}}$

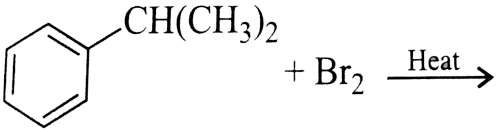
l. $CH_3CH = C(CH_3)_2 + HBr \rightarrow$

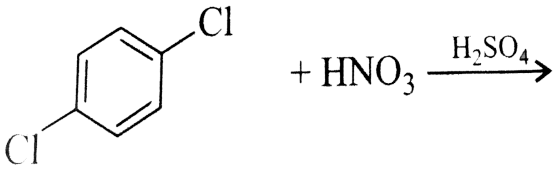
m. 

n. 

o. 

p. 

q. 

r. 

View Text Solution

Exercises Concept Application

1. How will you bring about the following conversations in not more than two steps?

a. Ethanlol to but -1 yne

b. Ethnee to bromoethene

c. Propene to 1 - Nitropropane

d. Toluene to benzyl alchol

e. Propane to propyne

f. Ethanol to ethyl fluoride

g. Bromomethane to prepanone

h. But -1 - $e \neq$ to but -2 - $e \neq$

i. 1 - Chlorobutane to n - octane

j. Bromocethane to cis-hex -3 - ene

k. Benyl alchol to phenylethanenitrile

l. Benzene to biphenyl

m. Cyclopentene to cycolpentya -1, 3 - diene

n. Anline to phenyl isocyanide

View Text Solution

2. a. A sample of $0.50g$ of an organic compound was treated according to Kjeldahal's method. The ammonia evolved was aboserved in $50ml$ of $0.5MH_2SO_4$. The residual acid required $60mL$ of $0.5M$ solution of $NaOH$ for neutralisation. Find the percentage composition of hnitrogen in the compound.

b. On analysis, $0.2g$ of a monobasic acid gave $0.505gm$ of CO_2 and $0.0864gmH_2O$. $0.305gm$ of this acid required $25ml$ of $M/10NaOH$ solution for neutralisaton. Find the molecular formula of the acid.

c. A liquid aromatic organcvi compound (A) conatining carbon $(92.3\,\%)$ and hydrogen $(7.7\,\%)$ decoluidsed $KMnO_4$ and on ozonolysis gave methanal and another compound (B). The molecular mass of (A) is 104. On treatment with a suitable catalyisis, (A) gave a high molecular mass solid product (C) having the same empirical formula as that of compound (A). Compound (C) is used in making toys and household goods. Identify (A), (B), and (C) and explain the reactions.

d. A sample of $0.246gm$ of an organic compound gave $0.198gm$ fo CO_2 and $0.104gm$ of H_2O on complete combusion. $.37gm$ of the compound gave

$0.638gm$ of silver bromide in Carius method. What is the molecular formula of the compound if its molecular mass is 109.

View Text Solution

3. Convert the following:

a, t - Butyl chloride to isobutyl bromide

b. Chloroentane to butane

c. 2 - Chloropropane to 1 - bromopropane

d. Bromo benzene to p - nitrophenol

e. Isopropyl alchol to iodofrom

f. 2 - Chloropropane to 1 - Propanal

g. Butene to n - butyl iodite

h. Ethyl bromide to propanoic acid.

i. 2 - Methyl prop - 1 ene to 2 - Chloro - 2 - methyl propane

j. 2 - Bromonbutane to $3, 4$ - dimethyl hexane

k. Anline to propane nitrile

m. Benzyl alcohol to phenyl ethonaic acid

n. Benzene to 4 - bromo nitro benzene

o. Toulene t benzyl alchohol

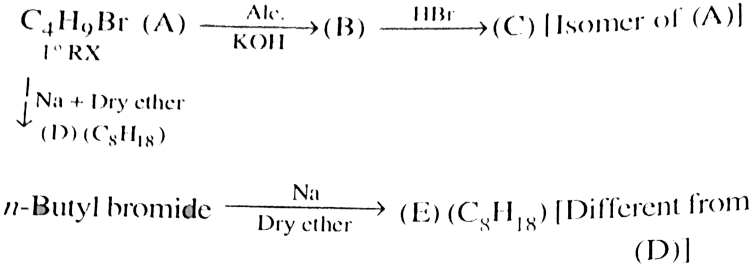
p. I - Bromopropane to 2 - bromobnpropane

q. Ethanol to but - 1 - yne

r. Propane to propan - 1 - ol

View Text Solution

4. Identify (A) to (E):

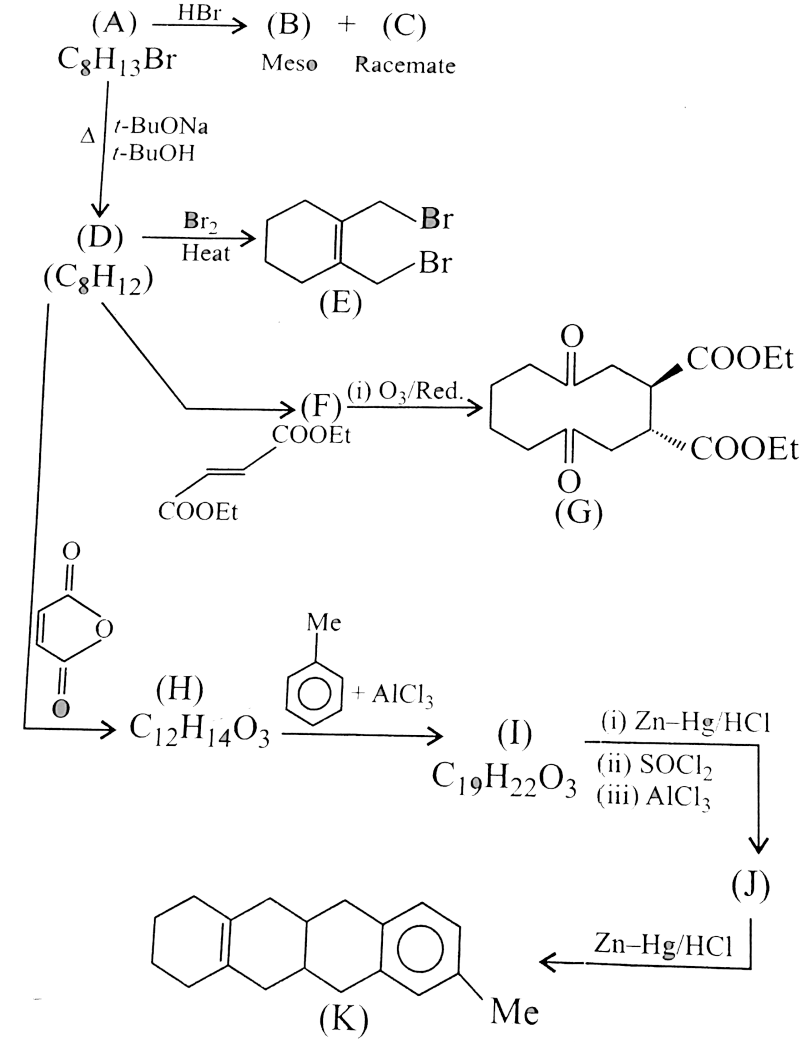


Watch Video Solution

Exercises Linked Compreshension

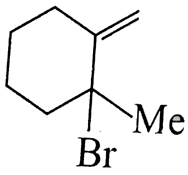
1. This section contains 11 pragraphs, Based on each paragraph, four to nine mutilple choice questions have to be answered. Each question has four mutiple chaoices questions have to be answered. Each question has four mutiple choices (a), (b), (c) and (d) out of which only one is correct or wrong.

Paragraph for Problems 1 - 8

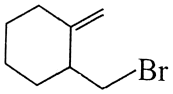


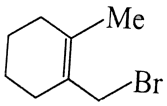
Compound (*A*) is:

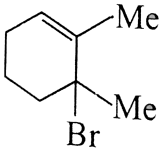
a.



A.

B. b. 

C. c. 

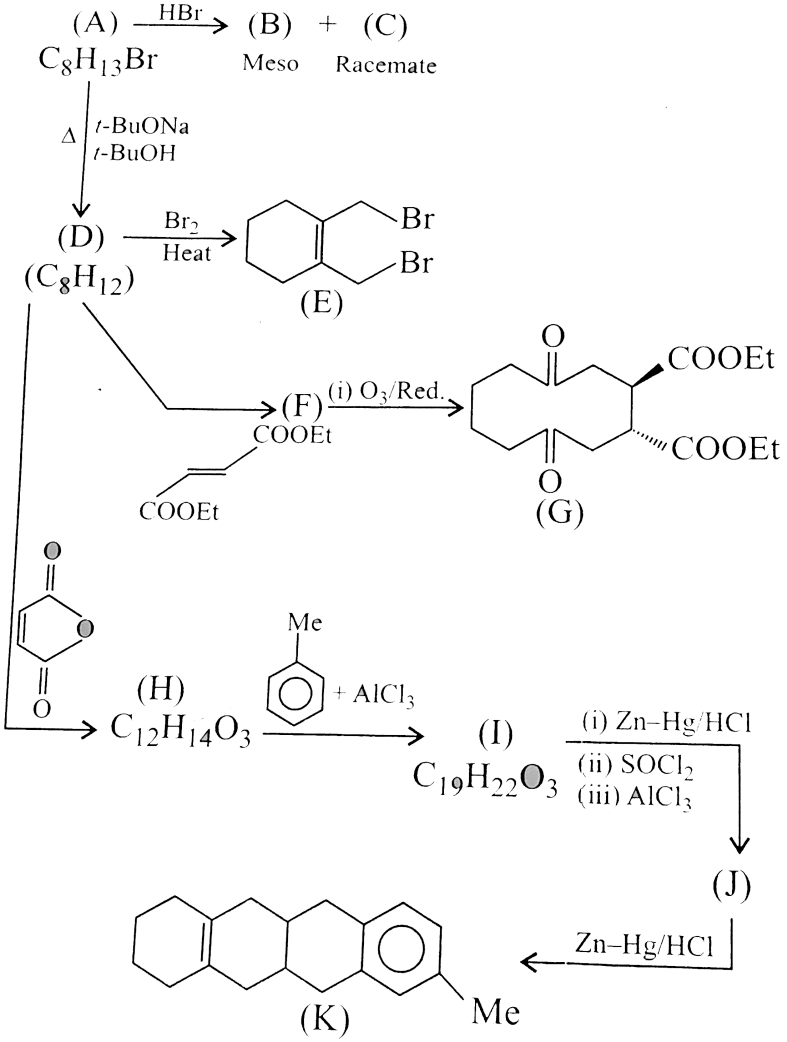
D. d. 

Answer: *a*

Watch Video Solution

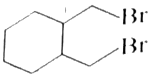
2. This section contains 11 pragraphs, Based on each paragraph, four to nine mutilple choice questions have to be answered. Each question has four mutiple chaoices questions have to be answered. Each question has four mutiple choices (a), (b), (c) and (d) out of which only one is correct or wrong.

Paragraph for Problems 1 - 8

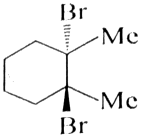


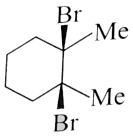
Compound (*B*) is:

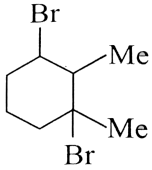
A.

a. 

B.

b. 

C. c. 

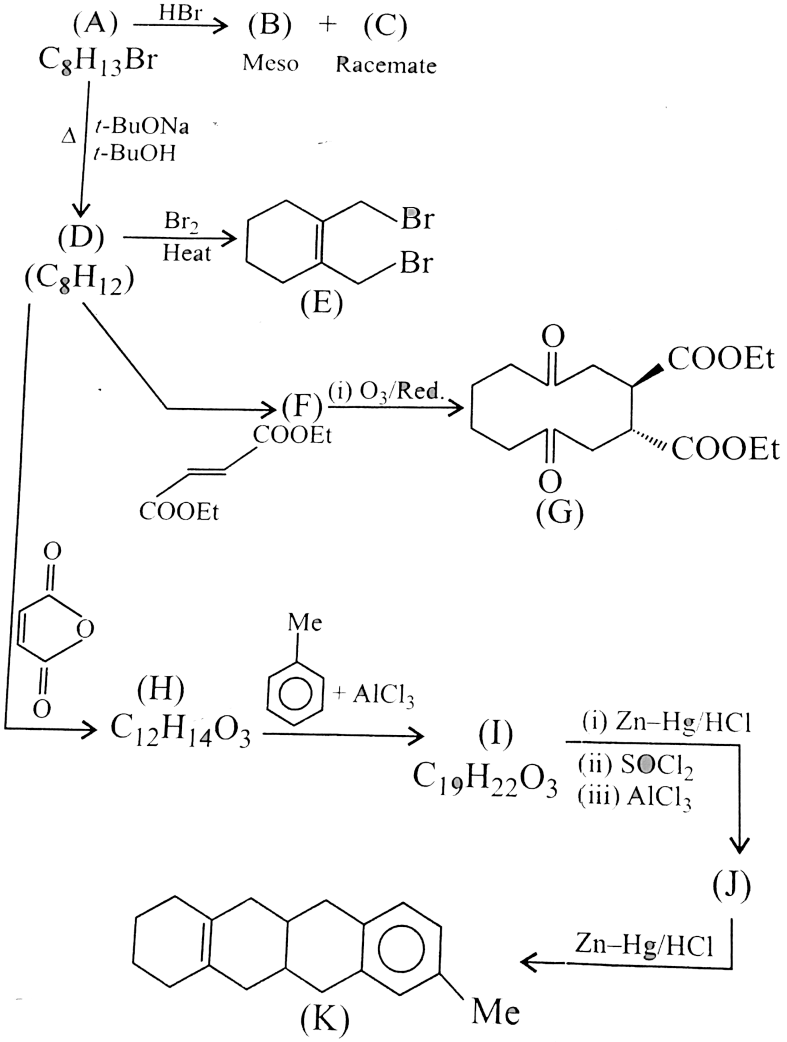
D. d. 

Answer: *c*

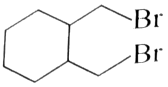
Watch Video Solution

3. This section contains 11 pragraphs, Based on each paragraph, four to nine mutilple choice questions have to be answered. Each question has four mutiple chaoices questions have to be answered. Each question has four mutiple choices (a), (b), (c) and (d) out of which only one is correct or wrong.

Paragraph for Problems 1 - 8



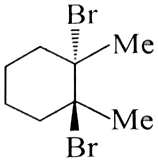
Compound (*C*) is:

a. 

A.

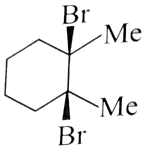
B.

b.



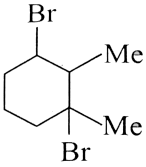
C.

c.



D.

d.

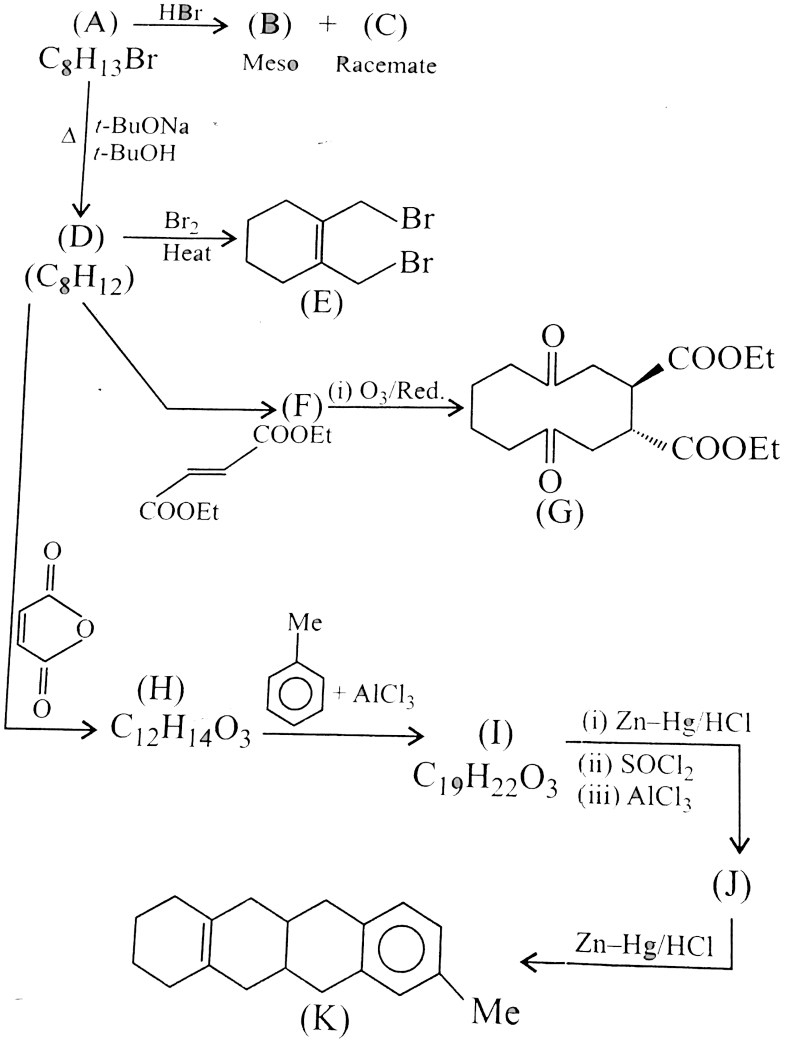


Answer: ***b***

Watch Video Solution

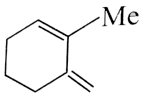
4. This section contains 11 pragraphs, Based on each paragraph, four to nine mutilple choice questions have to be answered. Each question has four mutiple chaoices questions have to be answered. Each question has four mutiple choices (a), (b), (c) and (d) out of which only one is correct or wrong.

Paragraph for Problems 1 - 8

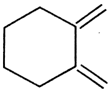


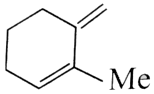
Compound (*D*) is:

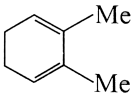
A. **a.**



B. **b.**



C. **c.** 

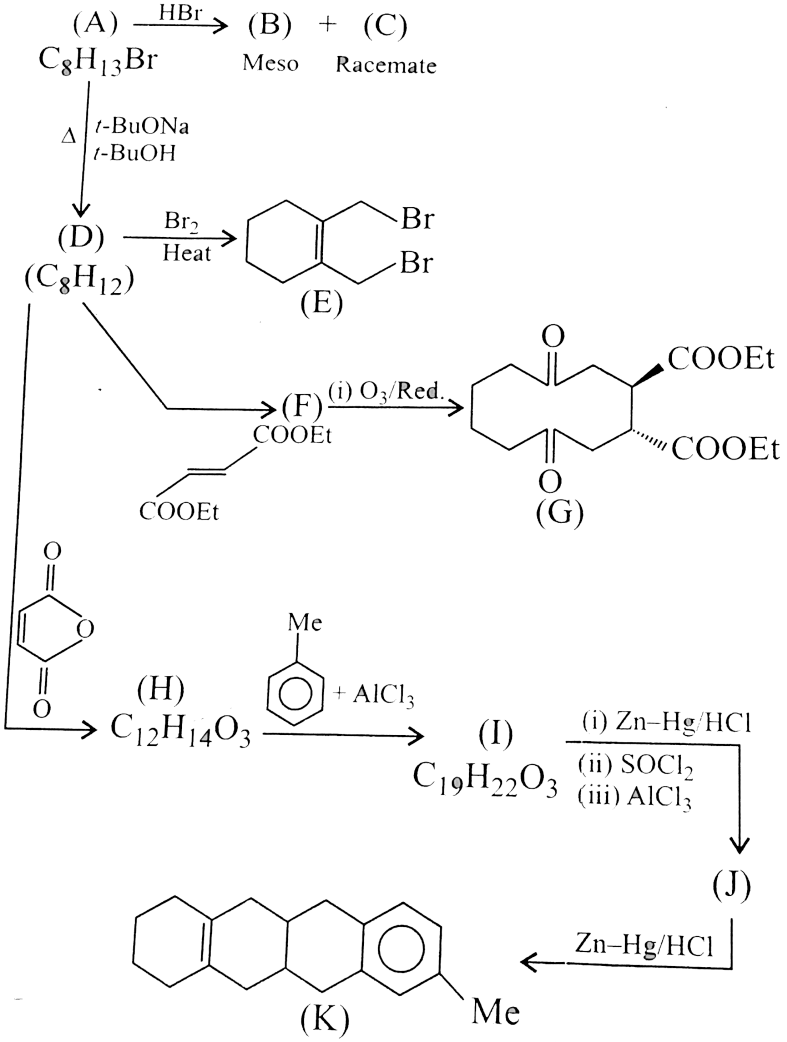
D. **d.** 

Answer: *b*

Watch Video Solution

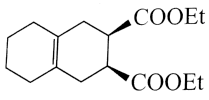
5. This section contains 11 pragraphs, Based on each paragraph, four to nine mutilple choice questions have to be answered. Each question has four mutiple chaoices questions have to be answered. Each question has four mutiple choices (a), (b), (c) and (d) out of which only one is correct or wrong.

Paragraph for Problems 1 - 8

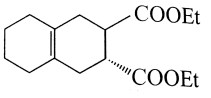


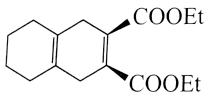
Compound (*F*) is:

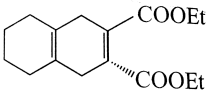
A. a.



B. b.



C. c. 

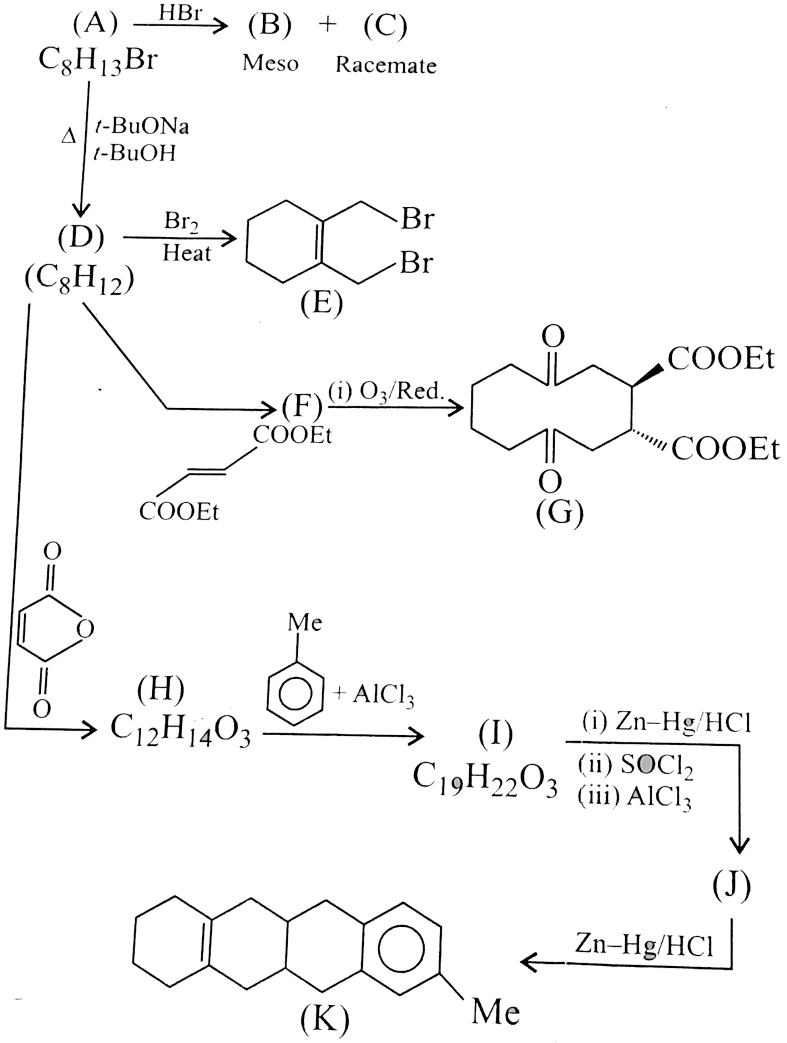
D. d. 

Answer: ***b***

Watch Video Solution

6. This section contains 11 pragraphs, Based on each paragraph, four to nine mutilple choice questions have to be answered. Each question has four mutiple chaoices questions have to be answered. Each question has four mutiple choices (a), (b), (c) and (d) out of which only one is correct or wrong.

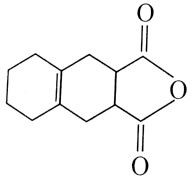
Paragraph for Problems 1 - 8

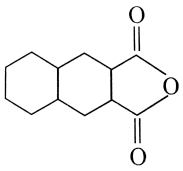


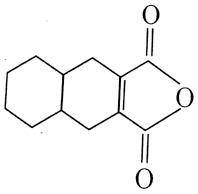
Compound (*H*) is:

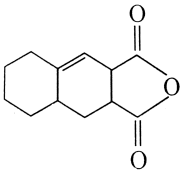
A.

a.



B. b. 

C. c. 

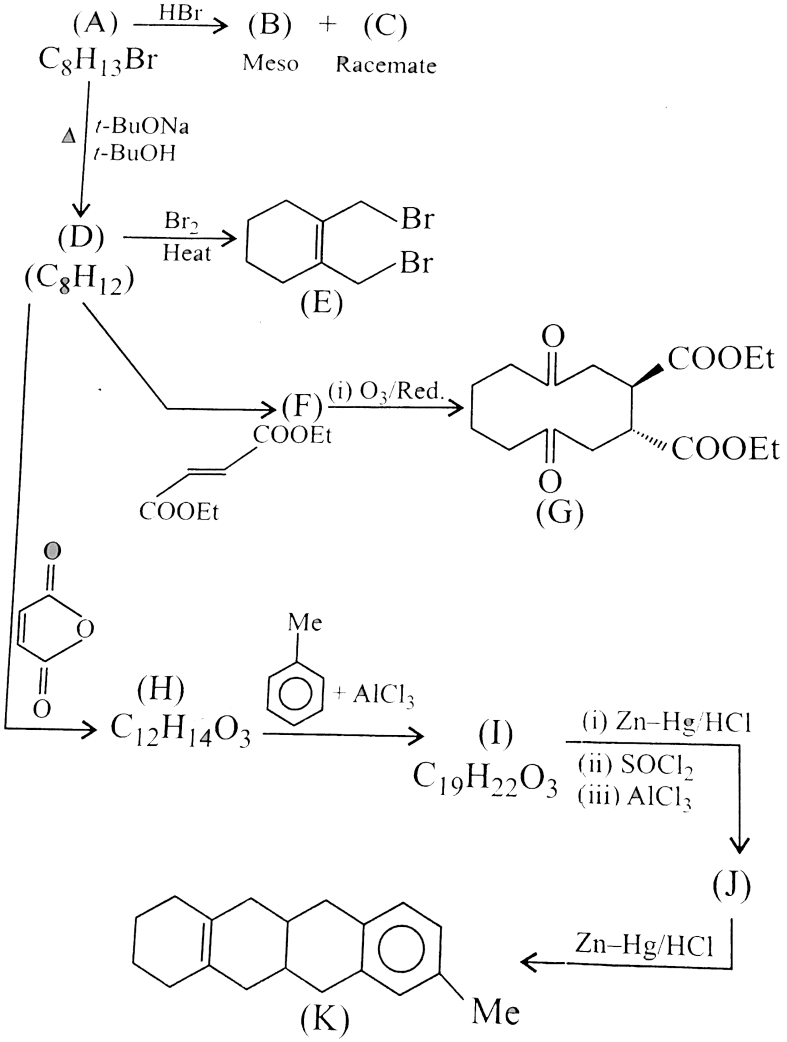
D. d. 

Answer: a

Watch Video Solution

7. This section contains 11 pragraphs, Based on each paragraph, four to nine mutilple choice questions have to be answered. Each question has four mutiple chaoices questions have to be answered. Each question has four mutiple choices (a), (b), (c) and (d) out of which only one is correct or wrong.

Paragraph for Problems 1 - 8

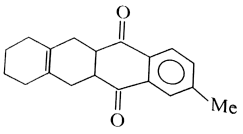


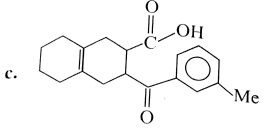
Compound (*I*) is:

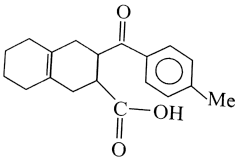
A.

b.

B.



C. 

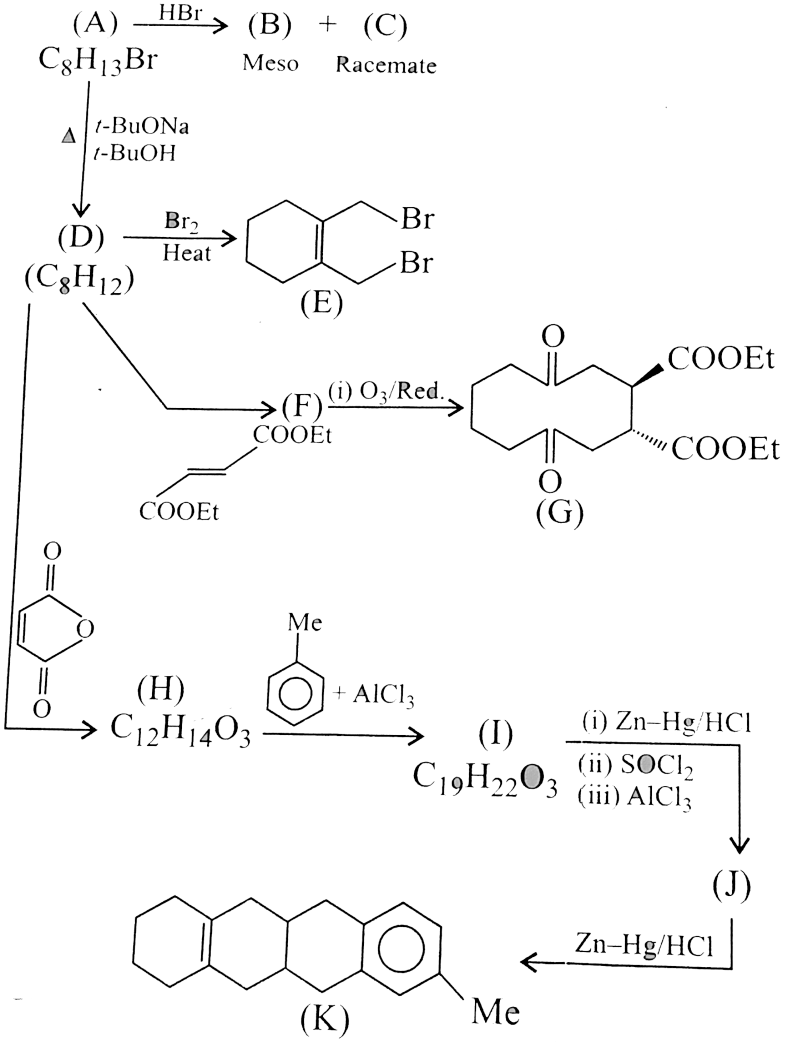
D. 

Answer: d

Watch Video Solution

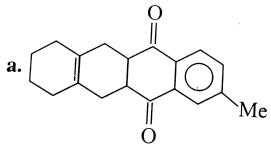
8. This section contains 11 pragraphs, Based on each paragraph, four to nine mutilple choice questions have to be answered. Each question has four mutiple chaoices questions have to be answered. Each question has four mutiple choices (a), (b), (c) and (d) out of which only one is correct or wrong.

Paragraph for Problems 1 - 8

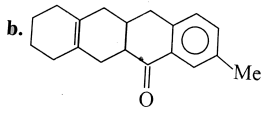


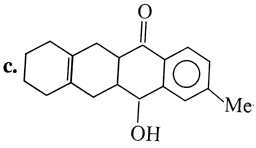
Compound (*J*) is:

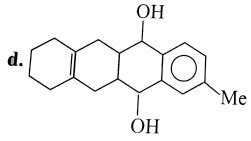
A.



B.



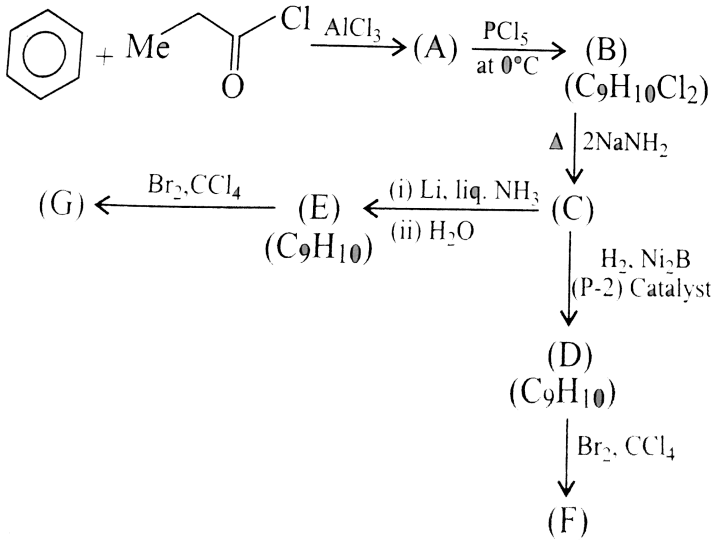
C. 

D. 

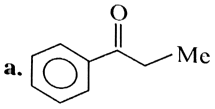
Answer: ***b***

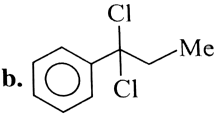
Watch Video Solution

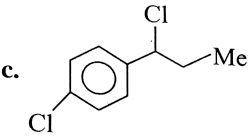
9. Paragraph for problems 9 - 15

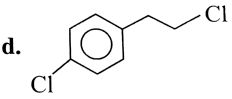


Compound (A) on reaction with $NH_2NH_2 + \overset{o-}{O}H$ is:

A. a. 

B. b. 

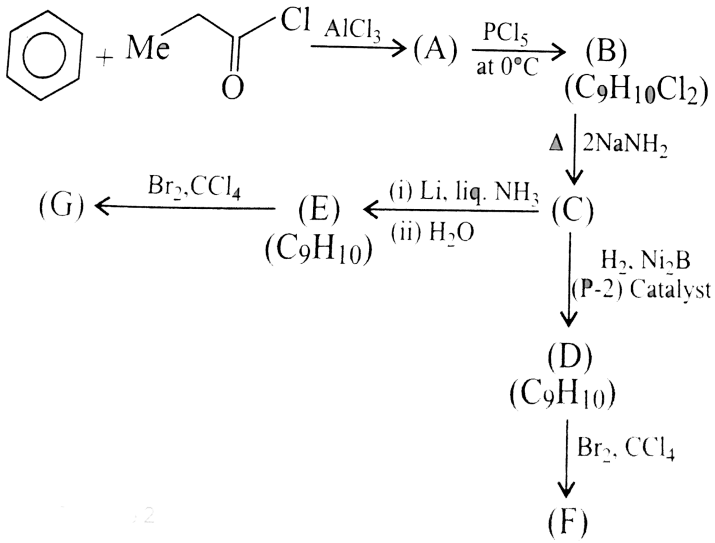
C. c. 

D. d. 

Answer: *c*

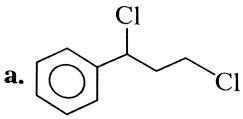
Watch Video Solution

10. Paragraph for problems 9 - 15

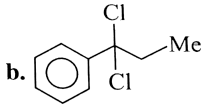


Compound (*B*) is:

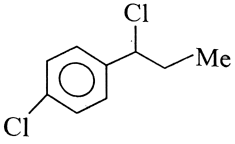
A. **a.**



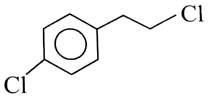
B. **b.**



C. **c.**



d.

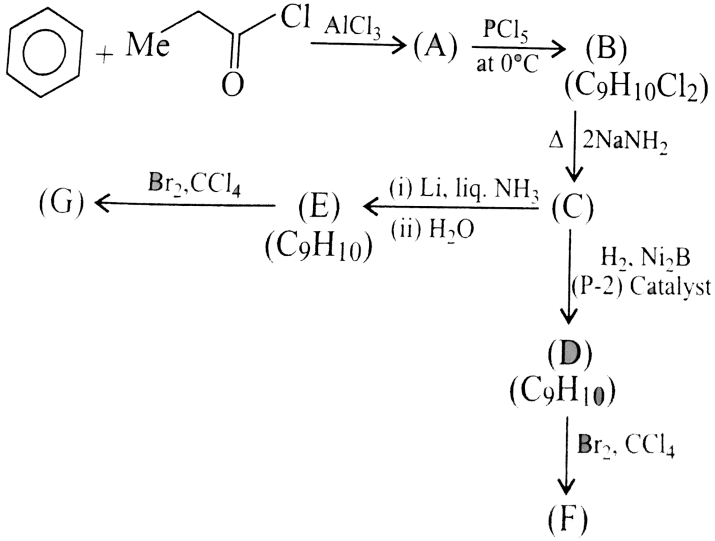


D.

Answer: ***b***

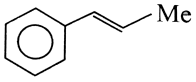
Watch Video Solution

11. Paragraph for problems 9 - 15

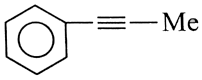


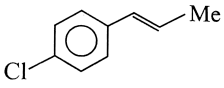
Compound (*C*) is:

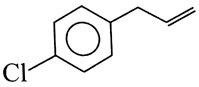
a.



A.

B. b. 

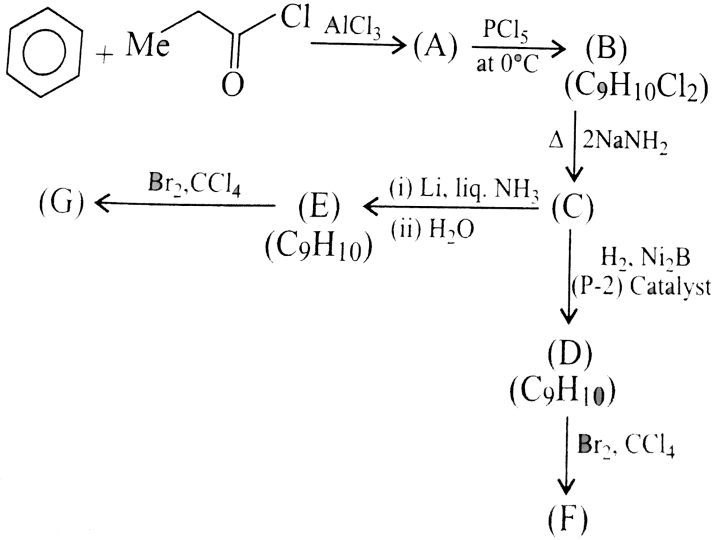
C. c. 

D. d. 

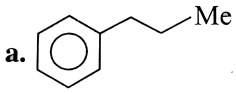
Answer: ***b***

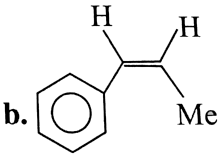
Watch Video Solution

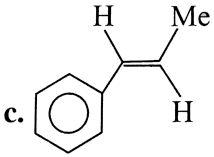
12. Paragraph for problems 9 - 15

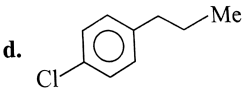


Compound (D) is:

A. 

B. 

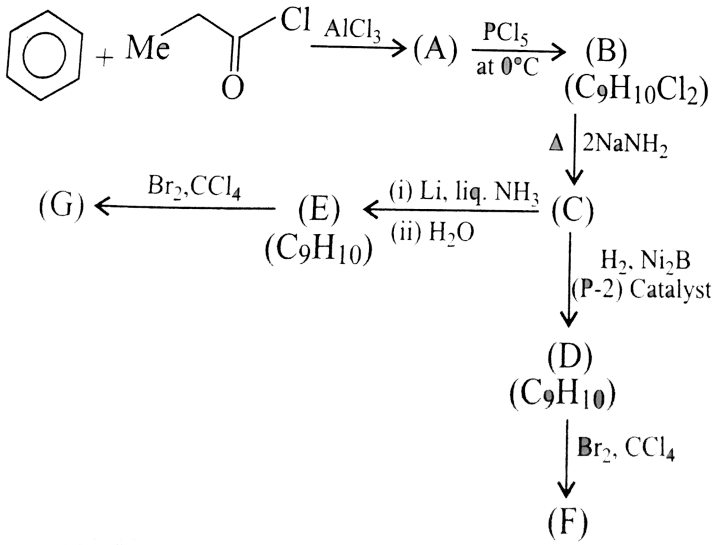
C. 

D. 

Answer: *b*

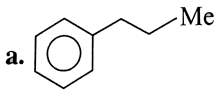
Watch Video Solution

13. Paragraph for problems 9 - 15

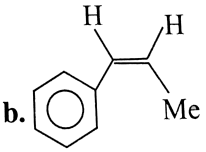


Compound (*E*) is:

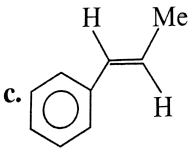
A.

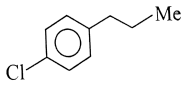


B.



C.

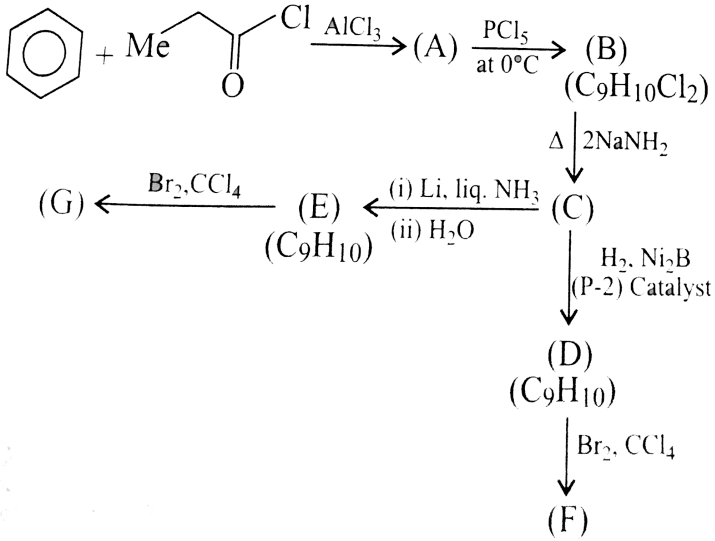


D. d. 

Answer: *c*

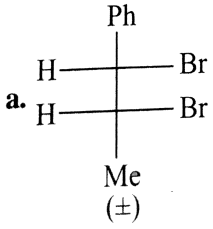
Watch Video Solution

14. Paragraph for problems 9 - 15

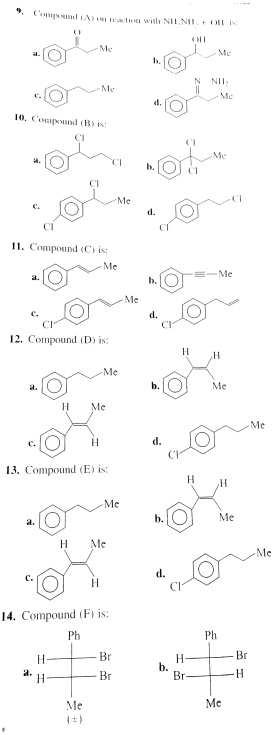


Compound (*F*) is:

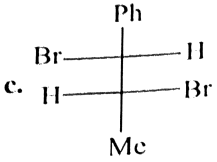
A.



B.



C.

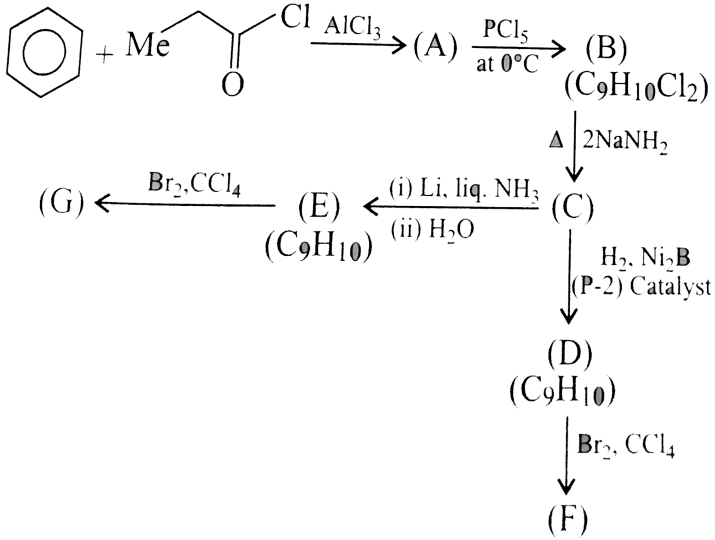


D.

Answer: *d*

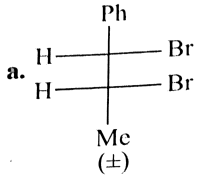
Watch Video Solution

15. Paragraph for problems 9 - 15

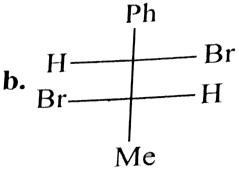


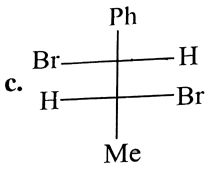
Compound (*G*) is:

A.



B.

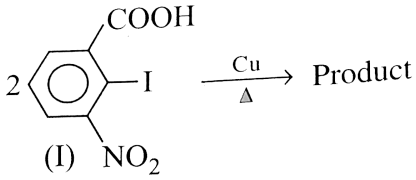


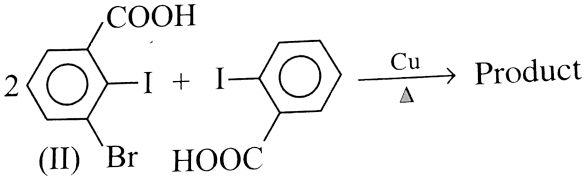
C. 

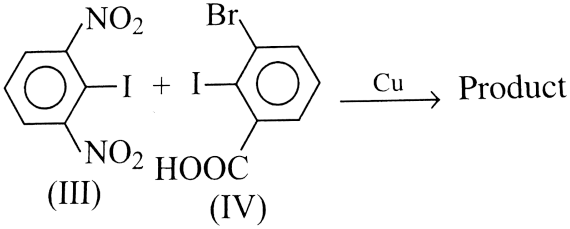
D. Both (b) and (c)

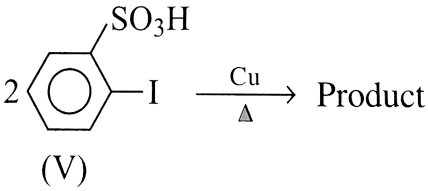
Answer: ***a***

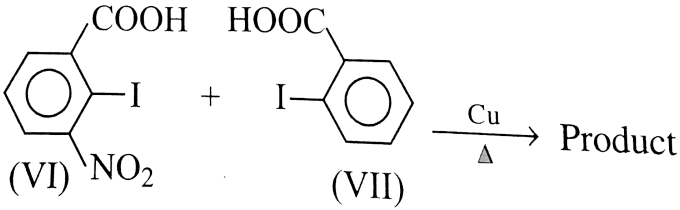
Watch Video Solution

i. 

ii. 

iii. 

iv. 

v. 

16.

All the reactions *i*) to (*v*) are examples of:

A. Wurtz reaction

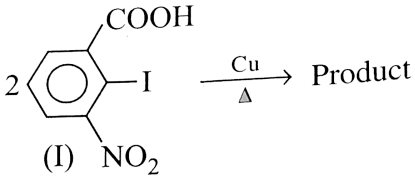
B. Wurtz-Fitting reaction

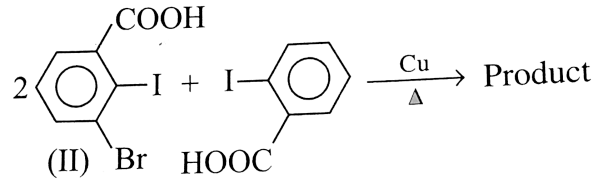
C. Ullmann reaction

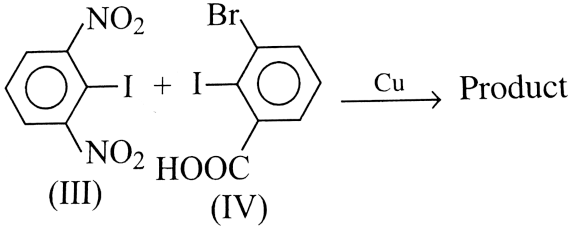
D. Frankland reaction

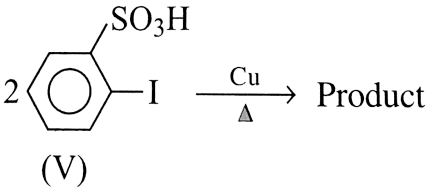
Answer: *c*

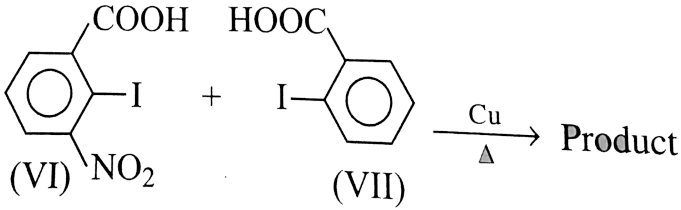
Watch Video Solution

i. 

ii. 

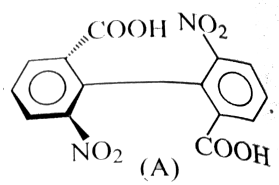
iii. 

iv. 

v. 

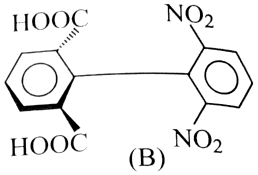
17.

The compound(*s*) in the reaction (*i*) is/are:



A. Resolove (+) and (-) forms of

B. Non-resolvable from of (A)

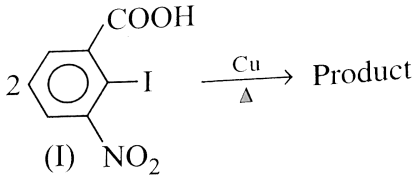
C. Resolvable (+) and (-) fomrs of 

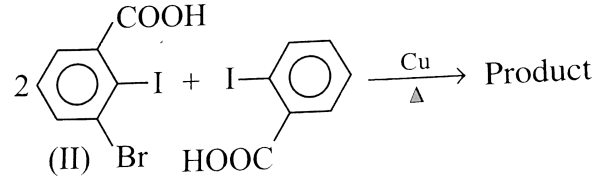
(B)

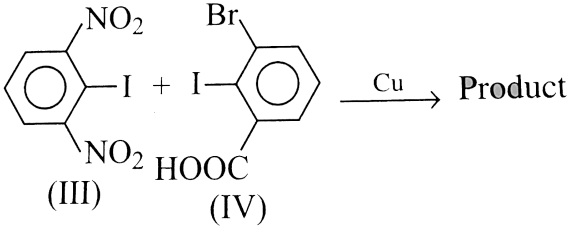
D. Non-resolvable form to (B).

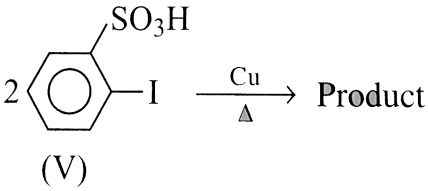
Answer: a

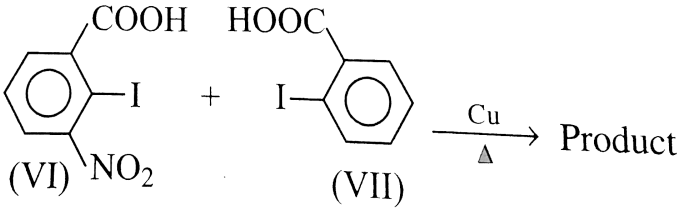
Watch Video Solution

i. 

ii. 

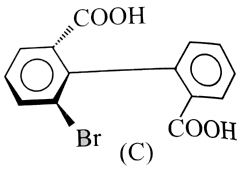
iii. 

iv. 

v. 

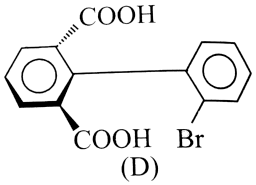
18.

The compound(*s*) in the reaction (*ii*) is/are:

A. Resolove (+) and (-) forms of 

B. Non-resolvable from of (C)

C. Resolvable (+) and (-) fomrs of

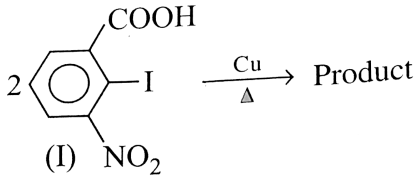


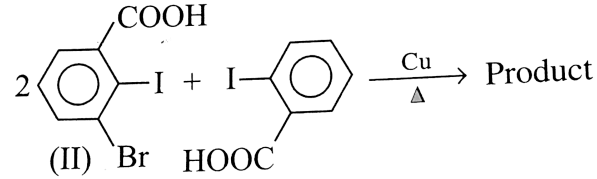
(D)

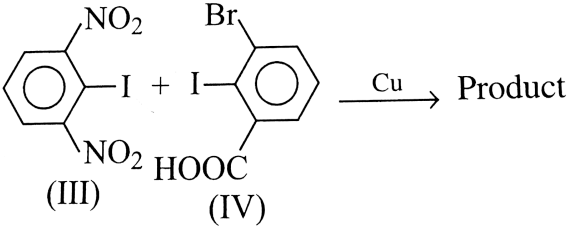
D. Non-resolvable form to (D).

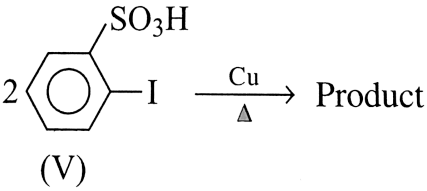
Answer: a

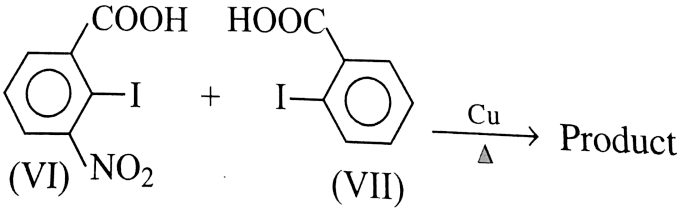
Watch Video Solution

i. 

ii. 

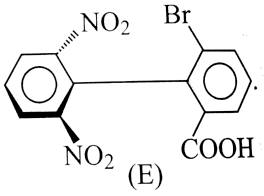
iii. 

iv. 

v. 

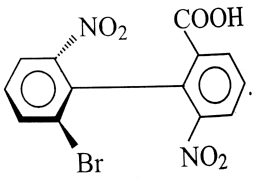
19.

The compound(*s*) in the reaction (*iii*) is/are:



A. Resolove (+) and (-) forms of

B. Non-resolvable from of (E)



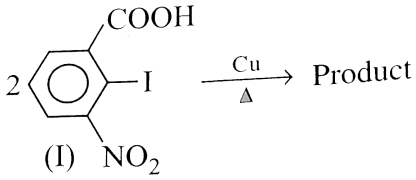
(F)

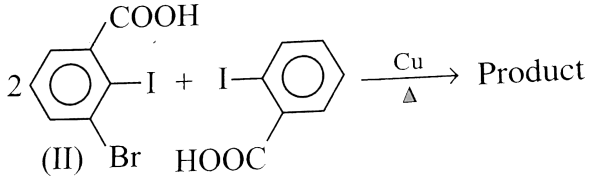
C. Resolvable (+) and (-) fomrs of

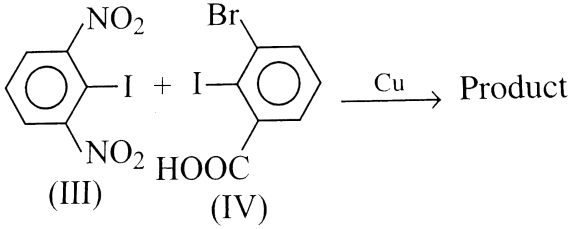
D. Non-resolvable form to (F).

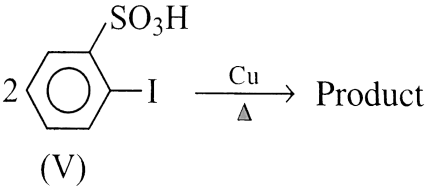
Answer: *b*

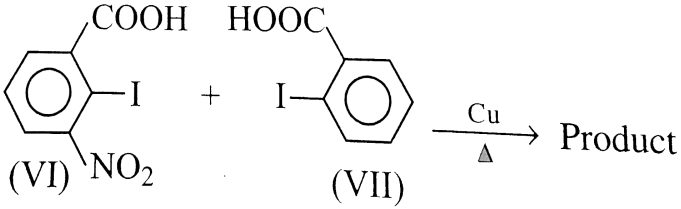
Watch Video Solution

i. 

ii. 

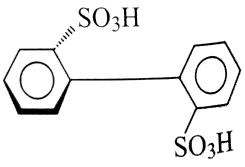
iii. 

iv. 

v. 

20.

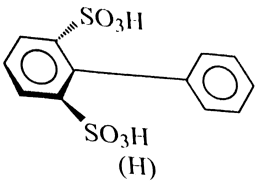
The compound(*s*) in the reaction (*iv*) is/are:



(G)

A. Resolove (+) and (-) forms of

B. Non-resolvable from of (G)



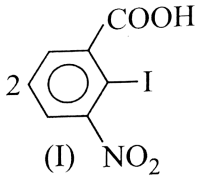
(H)

C. Resolvable (+) and (-) fomrs of

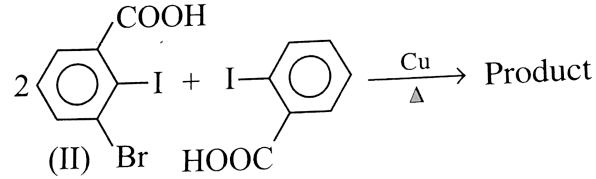
D. Non-resolvable form to (H).

Answer: a

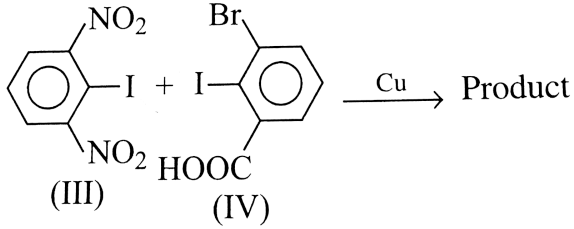
Watch Video Solution

i. 

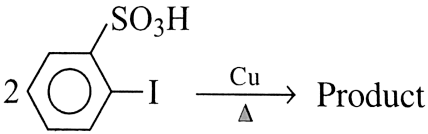
(I)

ii. 

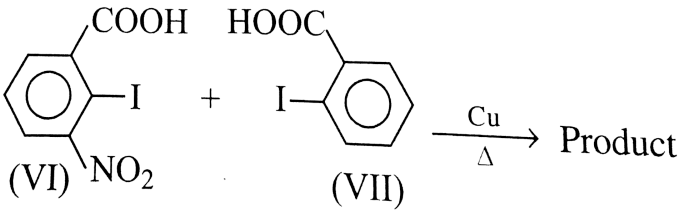
(II)

iii. 

(III) (IV)

iv. 

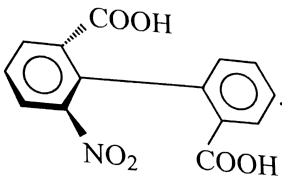
(V)

v. 

(VI) NO2 (VII)

21.

The compound(*s*) in the reaction (*v*) is/are:

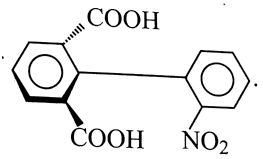


(I)

A. Resolove (+) and (-) forms of

B. Non-resolvable from of (I)

C. Resolvable (+) and (-) fomrs of



(J)

D. Non-resolvable form to (J).

Answer: a

Watch Video Solution

22. Compound (A), an alkene with molecule formula $\left(C_5H_{10}\right)$ exists in various strictures. On mononcholorination and dichlorination, it again shows various structures and streoisomers.

A. 5

B. 6

C. 7

D. 8

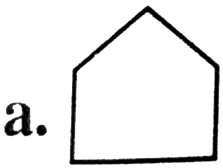
Answer: c

View Text Solution

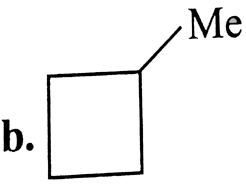
23. Compound (A), an alkene with molecule formula $\left(C_5H_{10}\right)$ exists in various strictures. On mononcholorination and dichlorination, it again shows various structures and streoisomers.

One of the cyclic isomers of (A) on monochlorination gives one product. The isomer (I) is:

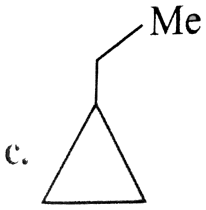
A.



B.

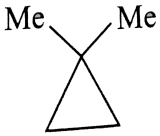


c.



C.

d.



D.

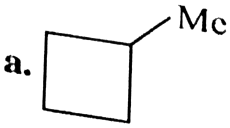
Answer: ***a***

View Text Solution

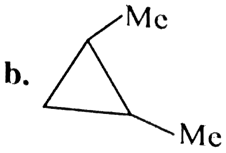
24. Compound (A), an alkene with molecule formula $\left(C_5H_{10}\right)$ exists in various strictures. On mononcholorination and dichlorination, it again shows various structures and streoisomers.

Another isomer (II) on monochlorination gives two products. The isomer (II) is:

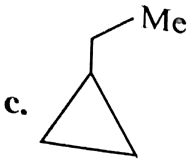
A.



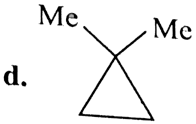
B.



C.



D.



Answer: ***d***

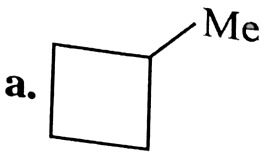
View Text Solution

25. Compound (A), an alkene with molecule formula $\left(C_5H_{10}\right)$ exists in various strictures. On mononcholorination and dichlorination, it again

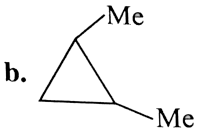
shows various structures and streoisomers.

Isomer (*III*) on monochlorination gives three products. The isomer (*III*) is:

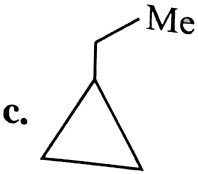
A.



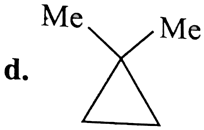
B.



C.



D.

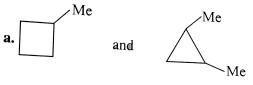


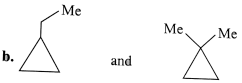
Answer: *b*

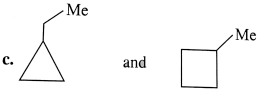
View Text Solution

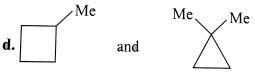
26. Compound (A), an alkene with molecule formula $\left(C_5H_{10}\right)$ exists in various strictures. On mononcholorination and dichlorination, it again shows various structures and streoisomers.

Two isomers (IV) and (V) on monochlorination give four products. The isomers (IV) and (V) are:

A. 

B. 

C. 

D. 

Answer: c

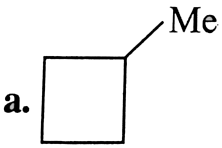
View Text Solution

27. Compound (A), an alkene with molecule formula $\left(C_5H_{10}\right)$ exists in various strictures. On mononcholorination and dichlorination, it again

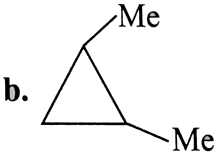
shows various structures and streoisomers.

Which isomer of (A) shows styereoisomerism ?

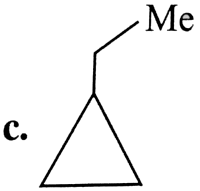
A.



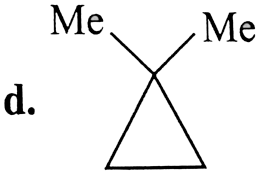
B.



C.



D.



Answer: ***b***

View Text Solution

28. Compound (A), an alkene with molecule formula $\left(C_5H_{10}\right)$ exists in various strictures. On mononcholorination and dichlorination, it again shows various structures and streoisomers.

The total number of stereoisomerism shown by isomer in Q.No 26 is:

A. 2

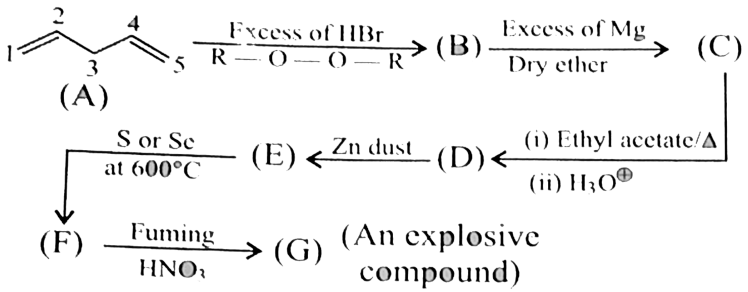
B. 3

C. 4

D. 5

Answer: b

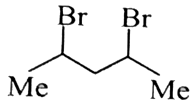
View Text Solution



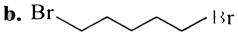
29.

Compound (*B*) is:

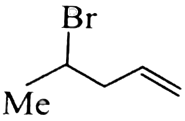
A. **a.**



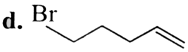
B. **b.**



C. **c.**

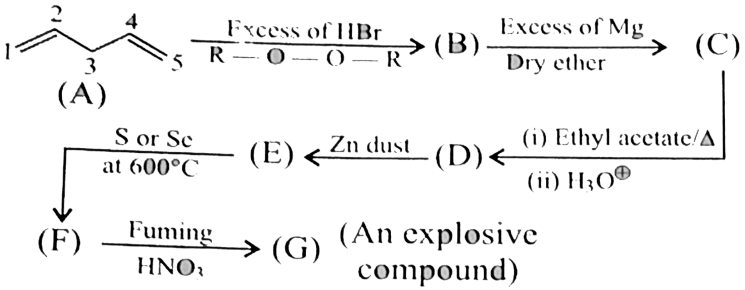


D. **d.**



Answer: *b*

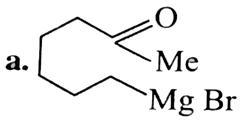
Watch Video Solution



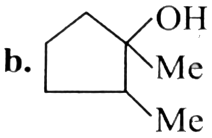
30.

Compound (*D*) is:

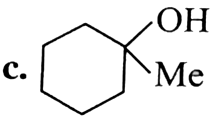
A.



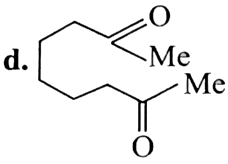
B.



C.

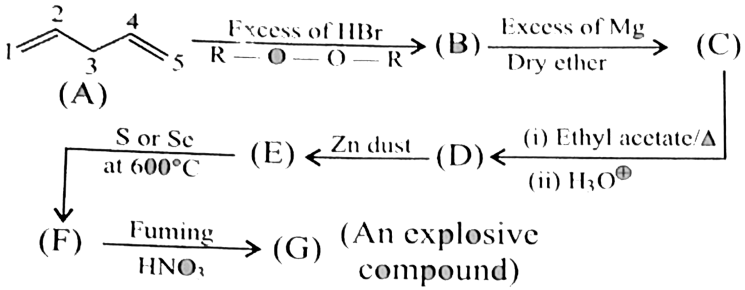


D.



Answer: *c*

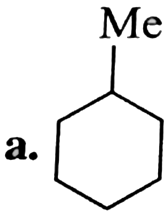
Watch Video Solution



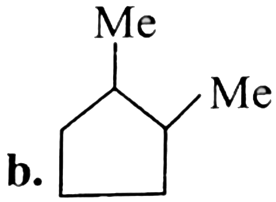
31.

Compound (*E*) is:

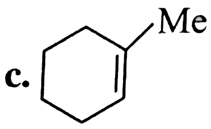
A.

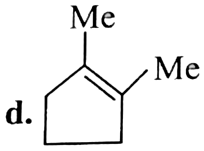


B.



C.

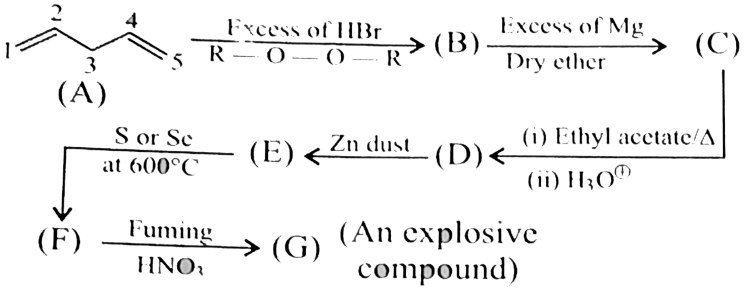




D.

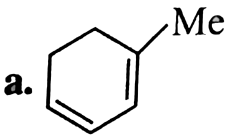
Answer: *a*

Watch Video Solution



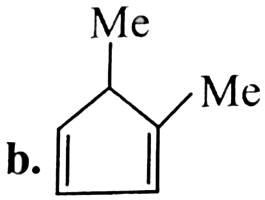
32.

Compound (F) is:

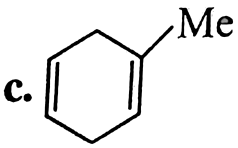


A.

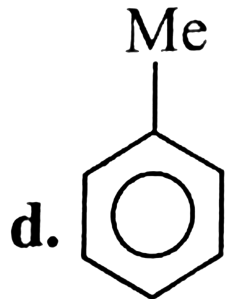
B.



C.

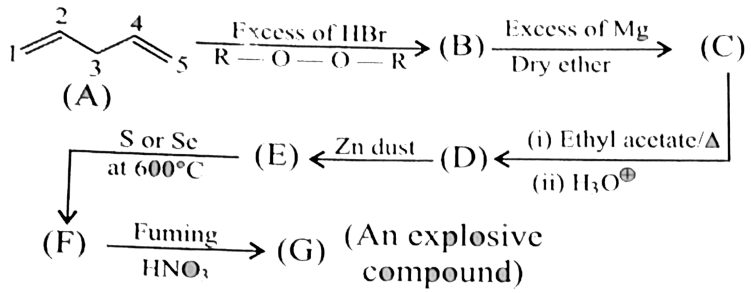


D.



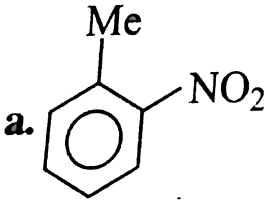
Answer: *d*

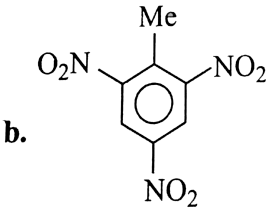
Watch Video Solution

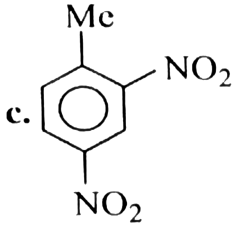


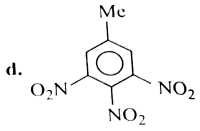
33.

Compound (*G*) is:

A. 

B. 

C. 

D. 

Answer: b

Watch Video Solution

34. A hydrocation $(A)\left(C_8H_{10}\right)(E)$ is a stream volatile compound and on nitration gives two mononitro derivatives. (A) gives the following reactions.

The name of (H) is:

A. Dibenzocylobutane

B. Dibenzocyclobutadiene

C. Dibenzocylobutane

D. Benzocyclobutane

Answer: b

View Text Solution

35. A hydrocation $(A)\left(C_8H_{10}\right)(E)$ is a stream volatile compound and on nitration gives two mononitro derivatives. (A) gives the following reactions.

Degree fo unsaturation (DU) in (H) is:

A. 7

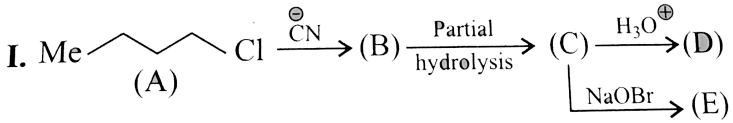
B. 8

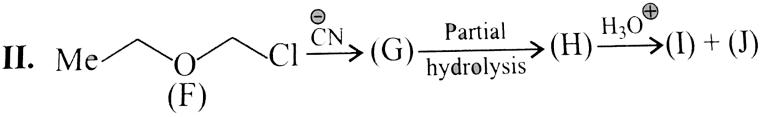
C. 9

D. 10

Answer: c

View Text Solution

I. 

II. 

36.

Compound (*B*) is:

A. *n* - *BU* - *C* ≡ *N*

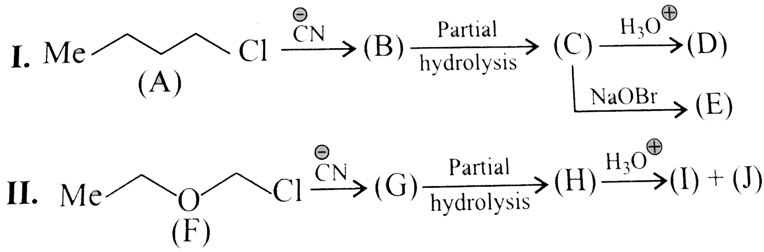
B. *n* - *Bu* - $\overset{\oplus}{N}$ ≡ *overser*(*o* -)(*C*)

C. Both

D. None

Answer: *a*

Watch Video Solution

37. 

Compound (C) is:

A. `Bu-COOH

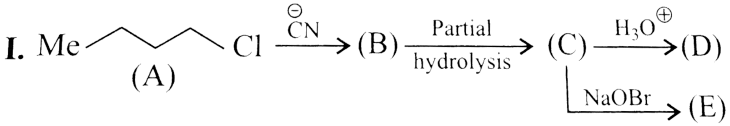
B. $Bu - NH - CHO$

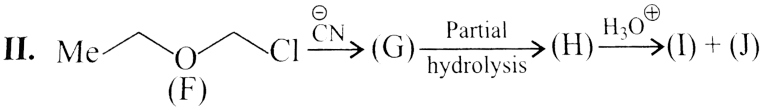
C. $Bu - \overset{O}{\overset{||}{C}} - NH_2$

D. $Bu - NH_2$

Answer: c

Watch Video Solution

I. 

II. 

38.

Compound (*D*) is:

A. `Bu-COOH

B. $Bu - NH - CHO$

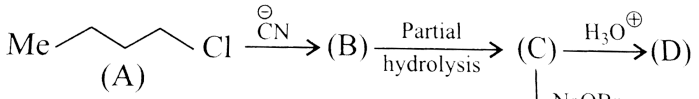
C. $Bu - \overset{\overset{O}{\|}}{C} - NH_2$

D. $Bu - NH_2$

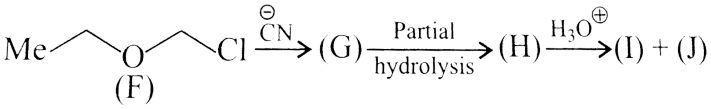
Answer: *a*

Watch Video Solution

I.



II.



39.

In the conversion of (C) to (E), (E) is Bu - NH_2. This reaction is called:

A. Halofrom reaction

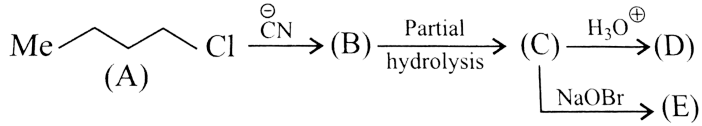
B. Halfrom reaction

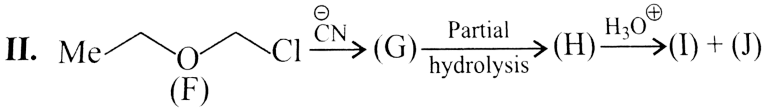
C. Hofmann bromide reaction

D. Hofmann bromide rearrangement reaction

Answer: ***d***

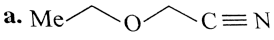
Watch Video Solution

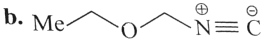
I. 

II. 

40.

Compound (*G*) is:

A. **a.** 

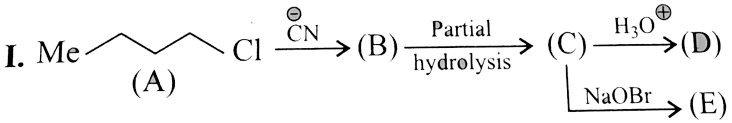
B. **b.** 

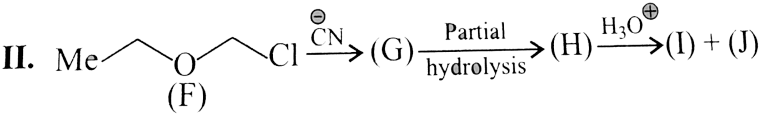
C. Both

D. None

Answer: *b*

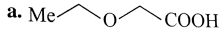
Watch Video Solution

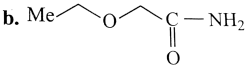
I. 

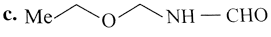
II. 

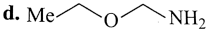
41.

Compound (*H*) is:

A. 

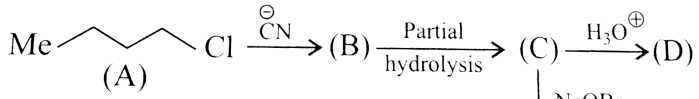
B. 

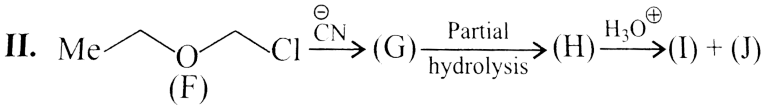
C. 

D. 

Answer: *c*

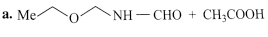
Watch Video Solution

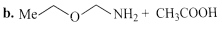
I. 

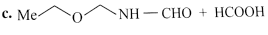
II. 

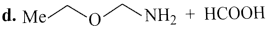
42.

The compounds (*I*) and (*J*) are respectively:

A. a. 

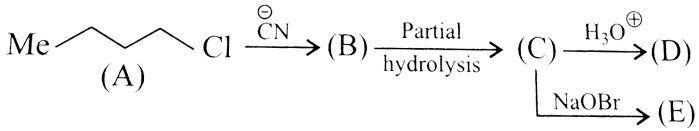
B. b. 

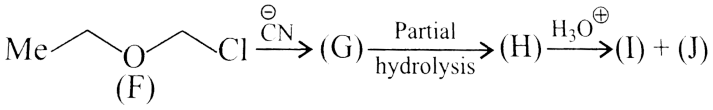
C. c. 

D. d. 

Answer: *d*

Watch Video Solution

I. 

II. 

43.

Which statement is wrong about the hydrolysis of $R - \overset{\oplus}{N} \equiv overset(o -)(C)$?

A. Isocyniders are hydroysed with aqueous with aqueous dilute acids but not by alkali.

B. In the hydrolysis of $\left(R - \overset{\oplus}{N} \equiv \overset{o-}{C}\right)$, first electrophile $\left(H^{\oplus}\right)$ adds on the C atom and then nucleophile adds to the same C atom.

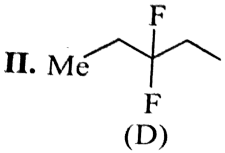
C. On partial hydrohysis, (RNC) gives 1° amine and $RCOOH$.

D.

Answer: ***d***

Watch Video Solution

I. BuI $\xrightarrow{AgNO_2}$ (B) $\xrightarrow{NaNO_2 + HCl}$ (C) $\xrightarrow{\overset{\ominus}{O}H}$ Blood red colouration

II.  $\xrightarrow{KNO_2}$ (E) $\xrightarrow{NaNO_2 + HCl}$ (F)

(D)

44.

Compound (B) is:

A. Bu - NO_2

B. Bu - O - $N = 0$

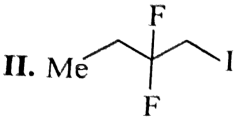
C. Both

D. None

Answer: *a*

Watch Video Solution

I. BuI $\xrightarrow{AgNO_2}$ (B) $\xrightarrow{NaNO_2 + HCl}$ (C) $\xrightarrow{\overset{\ominus}{O}H}$ Blood red colouration

II.  $\xrightarrow{KNO_2}$ (E) $\xrightarrow{NaNO_2 + HCl}$ (F)

(D)

45.

Compound (C) is:

A. $C_3H_7 - C(=N.OH) - NO_2$

B. $C_3H_7 - C(=N.OH) - ONO$

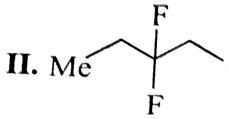
C. $C_3H_7 - CH(=N=O) - NO_2$

D. $C_3H_7 - CH(=N=O) - ONO$

Answer: *c*

Watch Video Solution

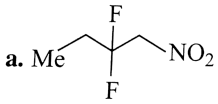
I. BuI $\xrightarrow{AgNO_2}$ (B) $\xrightarrow{NaNO_2 + HCl}$ (C) $\xrightarrow{\overset{\ominus}{O}H}$ Blood red colouration

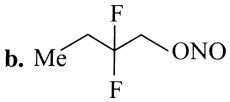
II. 

(D) $\xrightarrow{KNO_2}$ (E) $\xrightarrow{NaNO_2 + HCl}$ (F)

46.

Compound (E) is:

A. 

B. 

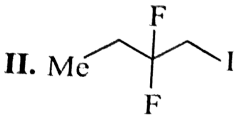
C. Both

D. None

Answer: *b*

Watch Video Solution

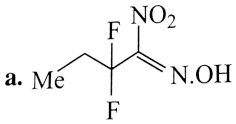
I. BuI $\xrightarrow{AgNO_2}$ (B) $\xrightarrow{NaNO_2 + HCl}$ (C) $\xrightarrow{\bar{O}H}$ Blood red colouration

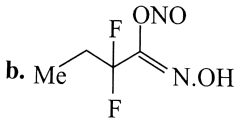
II.  $\xrightarrow{KNO_2}$ (E) $\xrightarrow{NaNO_2 + HCl}$ (F)

(D)

47.

Compound (F) is:

A. 

B. 

C. No reaction

D. Both (a) and (b)

Answer: c

Watch Video Solution

48. SN reaction is given by these compounds, which have a nuclophilic group and a good leaving EWG. It should be stable after leaving with bonding pair of $\bar{e}'s$ and it should have high polarisability.

Nucliphilic aliphatic substituion reaction is mainly of two types SN^{-1} and SN^2. SN^{-1} mechanism is a two step process. Reaction velocity of SN^{-1} depends only on the concentration of the subtrate. It proceeds via the formation of carbocation, optically active substrate gives ($\oplus$) and (o -) froms of the product.

In most of the cases, the product usually consists of $5 - 20\,\%$ inverted and $(95 - 80\,\%)$ racemised species. The more stable is the carbocation, the greater is the propotion of racemission. In solvolysis reaction, the more nucleophillic is the solvent, the greater is the proportion of inversion.

Which of the following will give SN reaction?

A. R - Br

B. R - N_3

C. R - $O^{\oplus}H_2$

D. All

Answer: d

View Text Solution

49. SN reaction is given by these compounds, which have a nuclophilic group and a good leaving EWG. It should be stable after leaving with bonding pair of $\bar{e}'s$ and it should have high polarisability.

Nucliphilic aliphatic substituion reaction is mainly of two types SN^{-1} and SN^2. SN^{-1} mechanism is a two step process. Reaction velocity of SN^{-1} depends only on the concentration of the subtrate. It proceeds via the formation of carbocation, optically active substrate gives ($\oplus$) and (o -) froms of the product.

In most of the cases, the product usually consists of 5 - $20\,\%$ inverted and (95 - $80\,\%$) racemised species. The more stable is the carbocation, the greater is the propotion of racemission. In solvolysis reaction, the more nucleophillic is the solvent, the greater is the proportion of

inversion.

Fugacity power of which group will be maximum?

A. $CH_3 - O - \overset{\overset{O}{||}}{\underset{\underset{O}{||}}{S}} - O - C_2H_5$

B. $CH_3 - O - \overset{\overset{O}{||}}{\underset{\underset{O}{||}}{S}} - O - CH_3$

C. 

D. $CH_3 - O - \overset{\overset{O}{||}}{C} - CH_3$

Answer: c

View Text Solution

50. SN reaction is given by these compounds, which have a nuclophilic group and a good leaving EWG. It should be stable after leaving with bonding pair of $\bar{e}'s$ and it should have high polarisability.

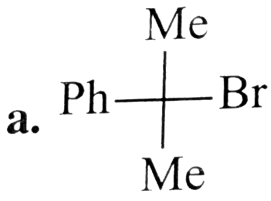
Nucliphilic aliphatic substituion reaction is mainly of two types SN^{-1} and SN^2. SN^{-1} mechanism is a two step process. Reaction velocity of SN^{-1} depends only on the concentration of the subtrate. It proceeds via the

formation of carbocation, optically active substrate gives ($\oplus$) and (o -) froms of the product.

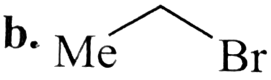
In most of the cases, the product usually consists of $5 - 20\,\%$ inverted and $(95 - 80\,\%)$ racemised species. The more stable is the carbocation, the greater is the propotion of racemission. In solvolysis reaction, the more nucleophillic is the solvent, the greater is the proportion of inversion.

Which of the following gives SN^1 reaction?

A. **a.**



B. **b.**



C. $MeBr$

D. All

Answer: ***a***

View Text Solution

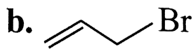
51. SN^2 reaction is a bimolecular reaction which takes places by the formation of $T.S.$ Veolcity of the reaction depends on the concentration of the substrate as well as the nucleophile.

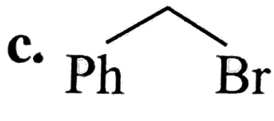
The reaction is favoureed by strong Nu^{o-} and in the presence of polar aprotic sovlent, optically active halides give. Walken inversion by SN^2 mechanism. The presence of hero group (atom) at β - C atom, unsaturation at β - C and $\left(- \overset{O}{\overset{\|}{C}} - \right)$ group at α - C atomn favor SN^2 mechanism.

Allyl halides and benzyl halides give SN^1 and SN^2 reactions. Allyl halides alos give SN^2 mechanism EDG at ortho- and para- postions in benzyl halides favors SN^1 mechanism, wheras EWG favors SN^2 mechanism.

Which of the following will give SN^2 mechanism?

A. $MeBr$

B. 

C. 

D. All

Answer: d

View Text Solution

52. SN^2 reaction is a bimolecular reaction which takes places by the formation of $T.S.$ Veolcity of the reaction depends on the concentration of the substrate as well as the nucleophile.

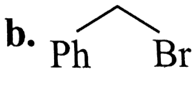
The reaction is favoureed by strong Nu^{o-} and in the presence of polar aprotic sovlent, optically active halides give. Walken inversion by SN^2 mechanism. The presence of hero group (atom) at β - C atom, unsaturation at β - C and $\left(- \overset{\overset{O}{\|}}{C} - \right)$ group at α - C atomn favor SN^2 mechanism.

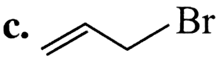
Allyl halides and benzyl halides give SN^1 and SN^2 reactions. Allyl halides alos give SN^2 mechanism EDG at ortho- and para- postions in benzyl

halides favors SN^1 mechanism, wheras EWG favors SN^2 mechanism.

Which of the following will give Walden inversion ?

A. C_4H_9 - CHD - Br,

B. 

C. 

D. All

Answer: a

View Text Solution

53. SN^2 reaction is a bimolecular reaction which takes places by the formation of $T.S.$ Veolcity of the reaction depends on the concentration of the substrate as well as the nucleophile.

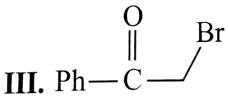
The reaction is favoureed by strong Nu^{o-} and in the presence of polar aprotic sovlent, optically active halides give. Walken inversion by SN^2 mechanism. The presence of hero group (atom) at β - C atom,

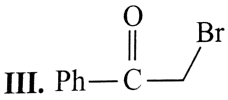
unsaturation at β - C and $\left(- \overset{O}{\overset{\|}{C}} - \right)$ group at α - C atomn favor SN^2 mechanism.

Allyl halides and benzyl halides give SN^1 and SN^2 reactions. Allyl halides alos give SN^2 mechanism EDG at ortho- and para- postions in benzyl halides favors SN^1 mechanism, wheras EWG favors SN^2 mechanism.

Which of the following will gives SN^2 mechanism gt

A. $EtBr$

B. III. 

C. III. 

D. All

Answer: *d*

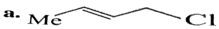
View Text Solution

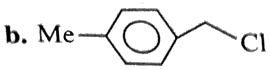
54. SN^2 reaction is a bimolecular reaction which takes places by the formation of $T.S.$ Veolcity of the reaction depends on the concentration of the substrate as well as the nucleophile.

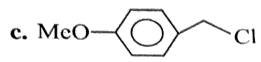
The reaction is favoureed by strong Nu^{o-} and in the presence of polar aprotic sovlent, optically active halides give. Walken inversion by SN^2 mechanism. The presence of hero group (atom) at β - C atom, unsaturation at β - C and $\left(- \overset{\overset{O}{\|}}{C} - \right)$ group at α - C atomn favor SN^2 mechanism.

Allyl halides and benzyl halides give SN^1 and SN^2 reactions. Allyl halides alos give SN^2 mechanism EDG at ortho- and para- postions in benzyl halides favors SN^1 mechanism, wheras EWG favors SN^2 mechanism.

Which of the following will give SN^1 reaction?

A. 

B. 

C. 

D. All

Answer: d

View Text Solution

55. Isoprophl bromide was treated separately with sodium ethoxide under two different conditions.

Reaction I:

Treatment of isopropyl bromide with $\left(Me_3CONa\right)$ at $40^\circ C$ gave almost exclusively compound $(A)\left(C_3H_6\right)$.

Reaction II:

Treatment of $(i\text{-}PrBr)$ with $NaOC_2H_5$ at $30^\circ C$ yileled compound $(A)\left(C_3H_6\right)$ along with a small amount of an ether $(B)\left(C_5H_{12}O\right)$.

Compound (A) was readily oxidised by a neutral solution of cold dil. $KMnO_4$ to give a brown preciptate.

The formations of (A) and (B) are best explained by:

A. SN^2 reaction and $E2$ reaction, respectively

B. $E2$ reaction and SN^2 reaction, respectively

C. $E1$ reaction and SN^1 reaction, respectively

D. $E2$ reaction and SN^1 reaction, respectively

Answer: ***b***

Watch Video Solution

56. Isoprophl bromide was treated separately with sodium ethoxide under two different conditions.

Reaction I:

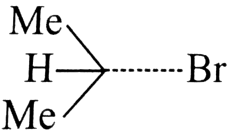
Treatment of isopropyl bromide with $\left(Me_3CONa\right)$ at $40\,^\circ C$ gave almost exclusively compound $(A)\left(C_3H_6\right)$.

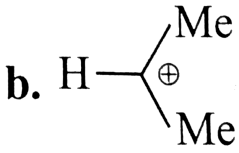
Reaction II:

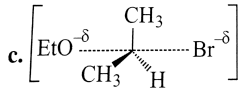
Treatment of $(i\text{-}PrBr)$ with $NaOC_2H_5$ at $30\,^\circ C$ yileled compound $(A)\left(C_3H_6\right)$ along with a small amount of an ether $(B)\left(C_5H_{12}O\right)$.

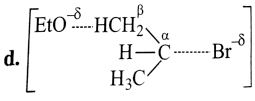
Compound (A) was readily oxidised by a neutral solution of cold dil. $KMnO_4$ to give a brown preciptate.

Which of the following most accureately repreasents the activated complex formed in reaction (II) that leads to compound (A) ?

A. 

B. 

C. 

D. 

Answer: *d*

Watch Video Solution

57. Isoprophl bromide was treated separately with sodium ethoxide under two different conditions.

Reaction I:

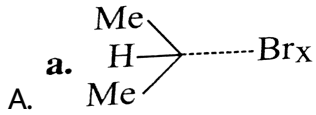
Treatment of isopropyl bromide with $\left(Me_3CONa\right)$ at $40\,^\circ C$ gave almost exclusively compound $(A)\left(C_3H_6\right)$.

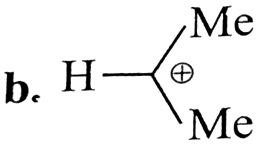
Reaction II:

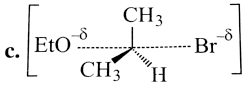
Treatment of $(i\text{-}PrBr)$ with $NaOC_2H_5$ at $30^\circ C$ yileled compound $(A)\left(C_3H_6\right)$ along with a small amount of an ether $(B)\left(C_5H_{12}O\right)$.

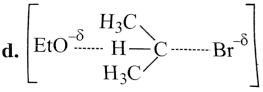
Compound (A) was readily oxidised by a neutral solution of cold dil. $KMnO_4$ to give a brown preciptate.

Referring to Q. No. 67 which of the following represents the intermediate $T.S$ for the formation of compound (B) ?

A. 

B. 

C. 

D. 

Answer: *c*

Watch Video Solution

58. IsoprophI bromide was treated separately with sodium ethoxide under two different conditions.

Reaction I:

Treatment of isopropyl bromide with $\left(Me_3CONa\right)$ at $40\,^\circ C$ gave almost exclusively compound $(A)\left(C_3H_6\right)$.

Reaction II:

Treatment of $(i\text{-}PrBr)$ with $NaOC_2H_5$ at $30\,^\circ C$ yileled compound $(A)\left(C_3H_6\right)$ along with a small amount of an ether $(B)\left(C_5H_{12}O\right)$.

Compound (A) was readily oxidised by a neutral solution of cold dil. $KMnO_4$ to give a brown preciptate.

Which of the following is an accurate representations of compound (B) ?

A. MeOMe`

B. $Et\text{-}O\text{-}Et$

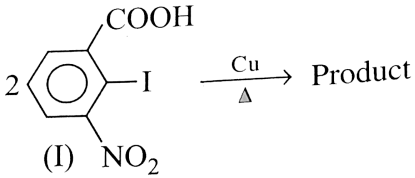
C. $i\text{-}Pr\text{-}O\text{-}Et$

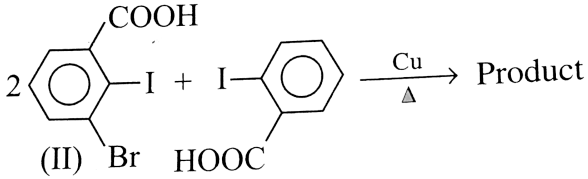
D. $EtOMe$

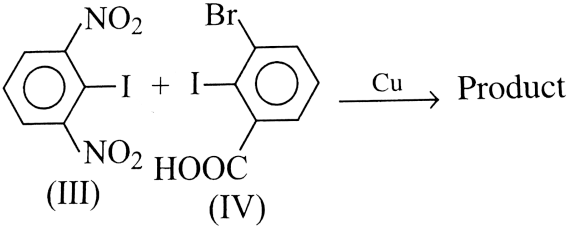
Answer: c

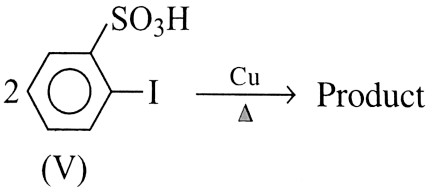
Watch Video Solution

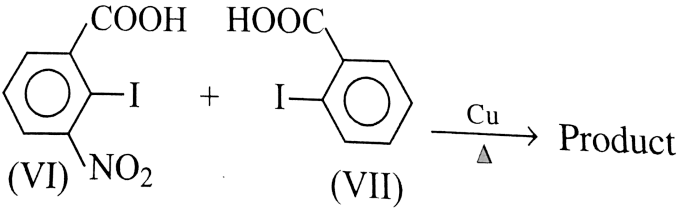
Exercises Linked Compreshension Type

i. 

ii. 

iii. 

iv. 

v. 

1.

The type of stereosim arising from restricted rotation about a single bond and where the stereoisomers can be isolated is called.

A. Krytomerism

B. Atropisomerism

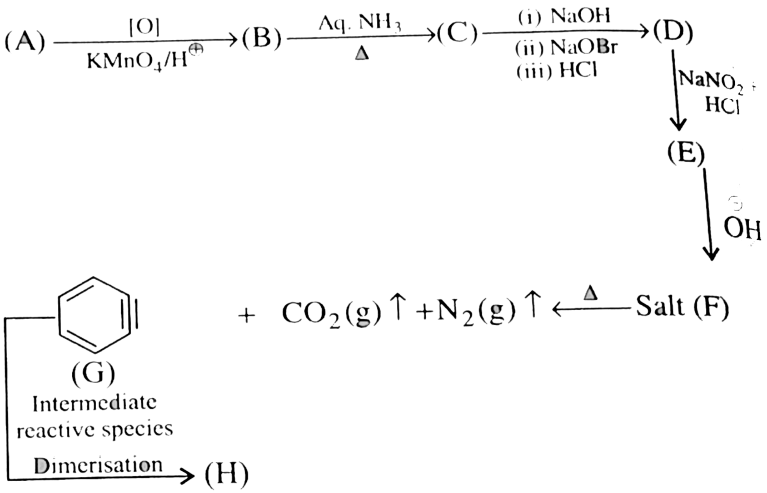
C. Alleotropism

D. Merotropy

Answer: ***b***

View Text Solution

2. A hydrocation $(A)\left(C_8H_{10}\right)(E)$ is a stream volatile compound and on nitration gives two mononitro derivatives. (A) gives the following reactions.



Compound `(A) is:

A. Ethylbenzene

B. p-Xylene

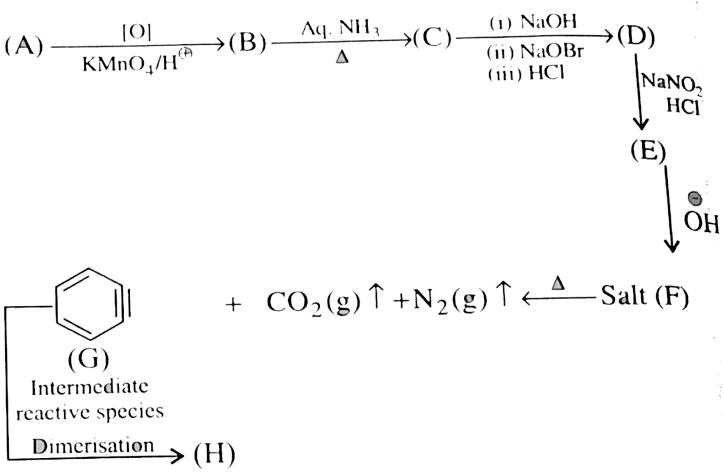
C. m-Xylene

D. o-Xylene

Answer: d

View Text Solution

3. A hydrocation $(A)\left(C_8H_{10}\right)(E)$ is a stream volatile compound and on nitration gives two mononitro derivatives. (A) gives the following reactions.



Compound `(B) is:

A. Phthalic acid

B. Isophthalic acid

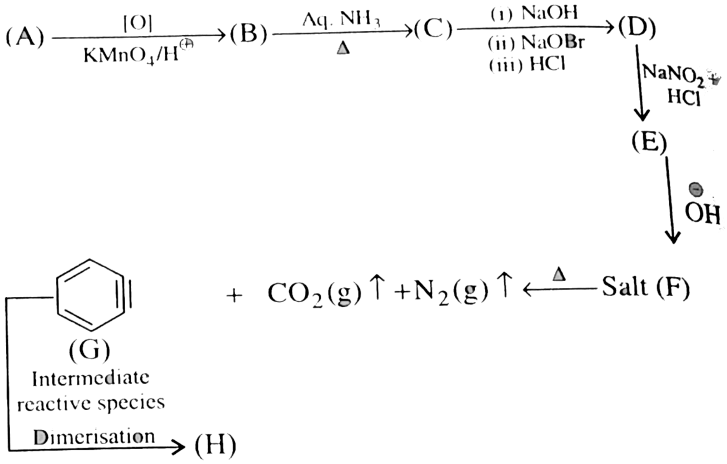
C. Terephthalic

D. Benzoic acid

Answer: *a*

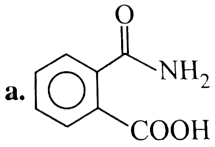
View Text Solution

4. A hydrocation $(A)\left(C_8H_{10}\right)(E)$ is a stream volatile compound and on nitration gives two mononitro derivatives. (A) gives the following reactions.

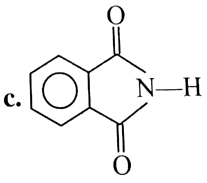


Compound `(C) is:

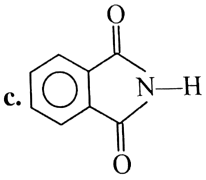
A.



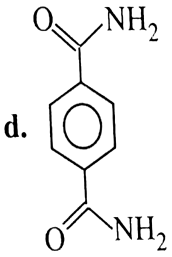
B.



C.



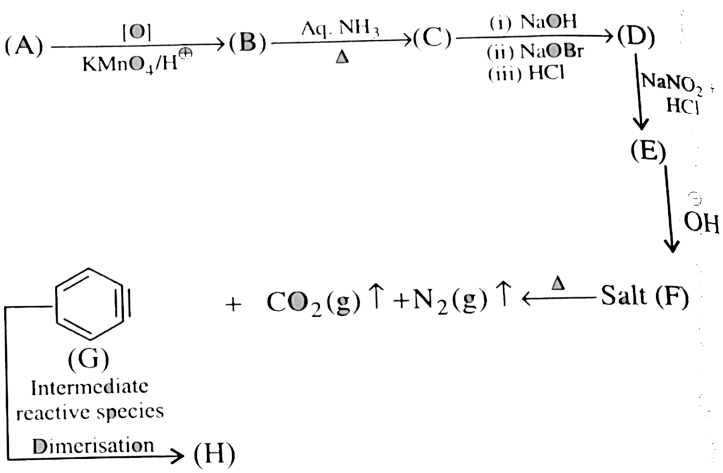
D.



Answer: *c*

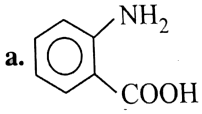
View Text Solution

5. A hydrocation $(A)\left(C_8H_{10}\right)(E)$ is a stream volatile compound and on nitration gives two mononitro derivatives. (A) gives the following reactions.

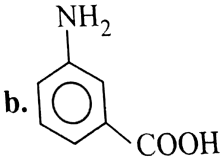


Compound `(D) is:

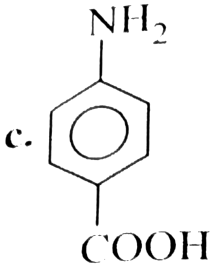
A.

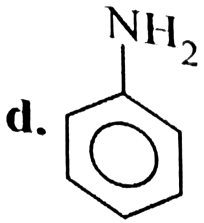


B.



C.



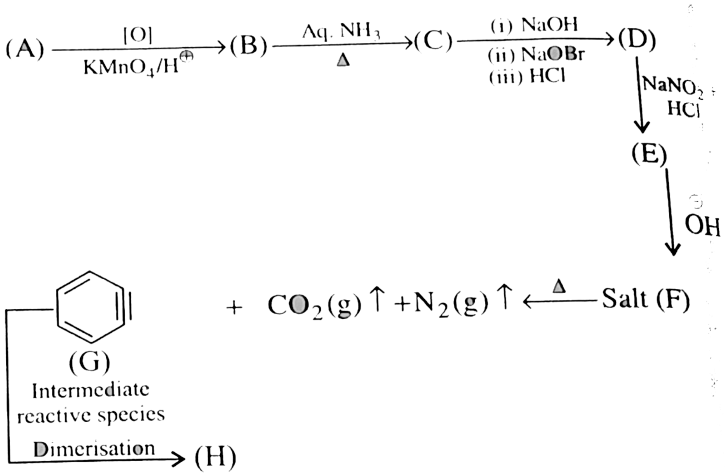


D.

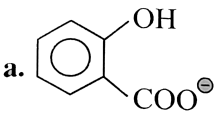
Answer: *a*

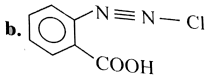
View Text Solution

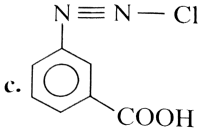
6. A hydrocation $(A)\left(C_8H_{10}\right)(E)$ is a stream volatile compound and on nitration gives two mononitro derivatives. (A) gives the following reactions.

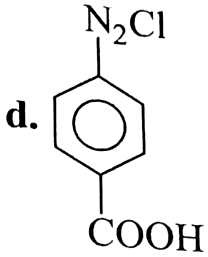


Compound `(E) is:

A. 

B. 

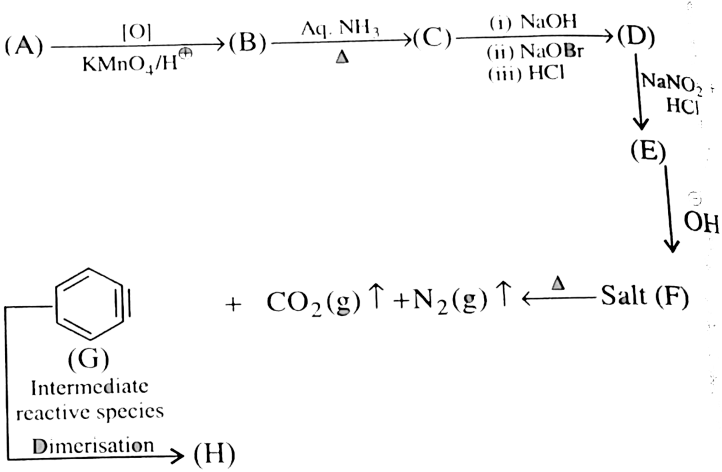
C. 

D. 

Answer: ***b***

View Text Solution

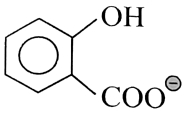
7. A hydrocation $(A)\left(C_8H_{10}\right)(E)$ is a stream volatile compound and on nitration gives two mononitro derivatives. (A) gives the following reactions.



Compound `(F) is:

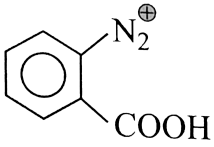
A.

a.



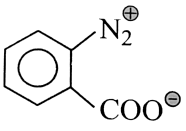
B.

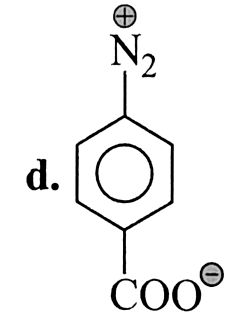
b.



C.

c.



d. 

D.

Answer: c

View Text Solution

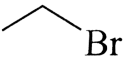
8. SN reaction is given by these compounds, which have a nuclophilic group and a good leaving EWG. It should be stable after leaving with bonding pair of $\bar{e}'s$ and it should have high polarisability.

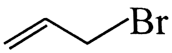
Nucliphilic aliphatic substituion reaction is mainly of two types SN^{-1} and SN^2. SN^{-1} mechanism is a two step process. Reaction velocity of SN^{-1} depends only on the concentration of the subtrate. It proceeds via the formation of carbocation, optically active substrate gives ($\oplus$) and (o -) froms of the product.

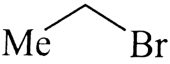
In most of the cases, the product usually consists of 5 - $20\,\%$ inverted

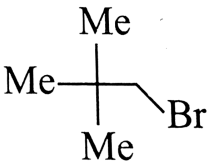
and $(95 - 80\,\%)$ racemised species. The more stable is the carbocation, the greater is the propotion of racemission. In solvolysis reaction, the more nucleophillic is the solvent, the greater is the proportion of inversion.

Which of the following gives SN^1 reaction?

I. 

II. 

III. 

IV. 

Select the correct answer.

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

B. (I) and (II)

C. (II), (III), and (IV)

D. (I), (III), and (IV)

Answer: *b*

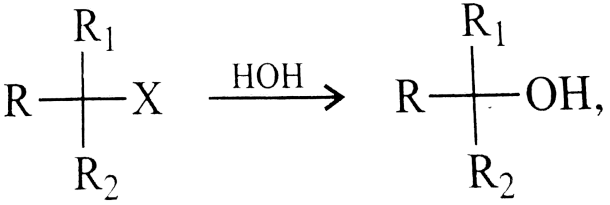
View Text Solution

9. SN reaction is given by these compounds, which have a nuclophilic group and a good leaving EWG. It should be stable after leaving with bonding pair of $\bar{e}'s$ and it should have high polarisability.

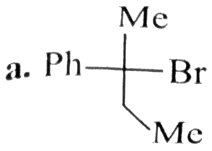
Nucliphilic aliphatic substituion reaction is mainly of two types SN^{-1} and SN^2. SN^{-1} mechanism is a two step process. Reaction velocity of SN^{-1} depends only on the concentration of the subtrate. It proceeds via the formation of carbocation, optically active substrate gives ($\oplus$) and (o -) froms of the product.

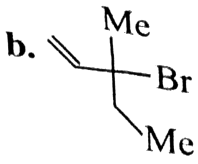
In most of the cases, the product usually consists of $5 - 20\,\%$ inverted and $(95 - 80\,\%)$ racemised species. The more stable is the carbocation, the greater is the propotion of racemission. In solvolysis reaction, the more nucleophillic is the solvent, the greater is the proportion of inversion.

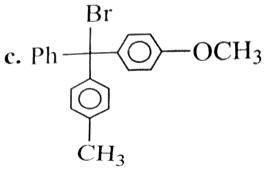
For the reaction

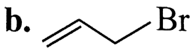


which substrate will give maximum racemismision ?

A. 

B. 

C. 

D. 

Answer: c

View Text Solution

10. SN^2 reaction is a bimolecular reaction which takes places by the formation of $T.S.$ Veolcity of the reaction depends on the concentration of the substrate as well as the nucleophile.

The reaction is favoureed by strong Nu^{o-} and in the presence of polar

aprotic sovlent, optically active halides give. Walken inversion by SN^2 mechanism. The presence of hero group (atom) at β - C atom, unsaturation at β - C and $\left(- \overset{O}{\overset{||}{C}} - \right)$ group at α - C atomn favor SN^2 mechanism.

Allyl halides and benzyl halides give SN^1 and SN^2 reactions. Allyl halides alos give SN^2 mechanism EDG at ortho- and para- postions in benzyl halides favors SN^1 mechanism, wheras EWG favors SN^2 mechanism.

Which of the following will give SN^2 reaction?

A. (I) and (II)

B. (I) and (III)

C. (I), (II), and (III)

D. All

Answer: c

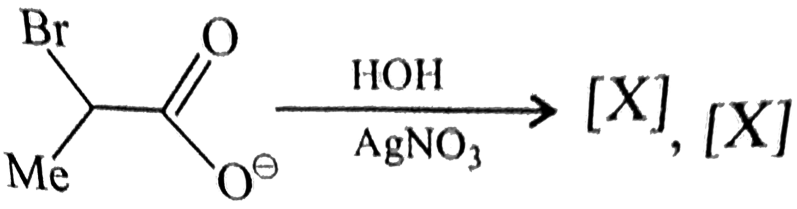
View Text Solution

11. SN^2 reaction is a bimolecular reaction which takes places by the formation of $T.S.$ Veolcity of the reaction depends on the concentration of the substrate as well as the nucleophile.

The reaction is favoureed by strong Nu^{o-} and in the presence of polar aprotic sovlent, optically active halides give. Walken inversion by SN^2 mechanism. The presence of hero group (atom) at β - C atom, unsaturation at β - C and $\left(- \overset{O}{\overset{\|}{C}} - \right)$ group at α - C atomn favor SN^2 mechanism.

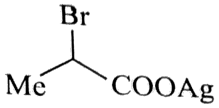
Allyl halides and benzyl halides give SN^1 and SN^2 reactions. Allyl halides alos give SN^2 mechanism EDG at ortho- and para- postions in benzyl halides favors SN^1 mechanism, wheras EWG favors SN^2 mechanism.

In the reaction



A. C_2H_5Br

B. a. C_2H_5Br

C. b. 

D. $CH_2 = CH_2$

Answer: *c*

View Text Solution

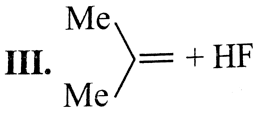
Exercises Multiple Correct

1. Both t - butyl and $\left(-SO_3H\right)$ groups are used as a blocking group in certain synthesis of organic compounds. Which of the following statements are correct?

A. t - Butyl group is easily introduced by any of the varitions of the Friedel-Crafts alkylation reacton.

B. t-*Butylgroupcanbe*$\int$ or *ducedbyusing*: *I.* Me_(3)C - Cl + AlCl_(3)*II.*

Me_(3)C - OH + BF_(3)`

III. 

C. t - Butyl group can be easily removed under acidic conditions, beucase of the stability of tert-butyl cations.

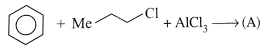
D. t - Butyl group has advantage over a $\left(- SO_3H \right)$ group as a blocking group, becuase t - butyl group activates the ring to further SE reaction.

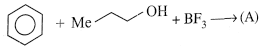
Answer: (*a*, *b*, *c*, *d*)

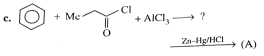
View Text Solution

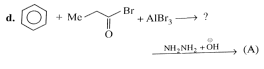
2. Which compound in each of the following paris will react faster in SN^2 reaction with HO^{o-} ?

a. CH_(3)Br or CH_(3)I*b*. (CH_(3))_(3)CCl or CH_(3)Cl*c*. CH_(2) = CHBr or CH_(2) = CH - CH_(2)Br`

A. 

B. 

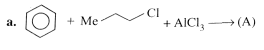
C. 

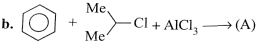
D. 

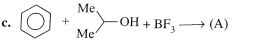
Answer: (*c*, *d*)

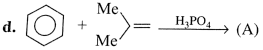
View Text Solution

3. Which of the following are the best methods for the preparation of cument (*A*) ?

A. 

B. 

C. 

D. d. 

Answer: (*b*, *c*, *d*)

View Text Solution

4. In Dow's process for the process for the manufacture of phenol, $PhCl$ is fused with $NaOH$ at elevated temperature under pressure.

$$PhCl \xrightarrow[623K,\,300\text{atm}]{NaOH} [\text{Intermediate}] \xrightarrow{H_2O} \text{Phenol}\,(A) + (B + C)\text{Side product}$$

Which of the following statements are correct:

A. Pheonal is formed via the formation of benzyene intermedicate.

B. p - Phenyl phenol is also formed as by-product.

C. Diphenylether is also formed as a by-product.

D. Biphenylene is also fomed as by-product.

Answer: `(a,b,c)

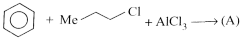
View Text Solution

5. Which of the following statements are correct.

A. $\overset{o-}{O}H$ is weaker nuckeophile than H_2O.

B. $R-\ddot{S}..H$ is a stronger nuclophile than $R-\ddot{O}..H$ in polar protic solvent such as as ethanol.

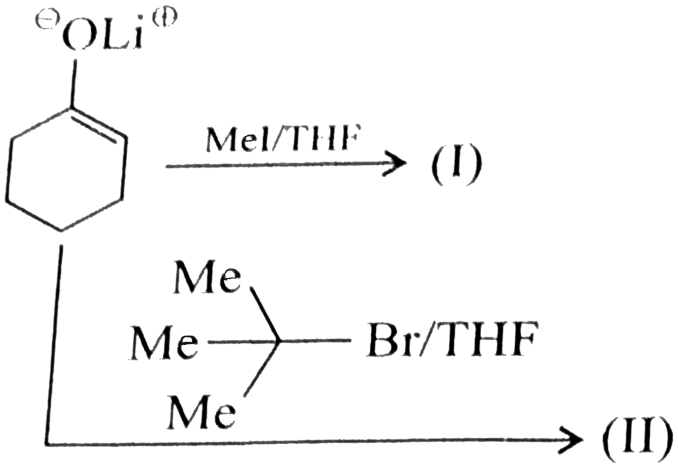
C. $\ddot{N}H_3$ is a weaker nucleophile than $H_2\ddot{H}$.

D. 

(I) is a stronger nucleophile than $\left(C_2H_5\right)_3\ddot{N}(II)$.

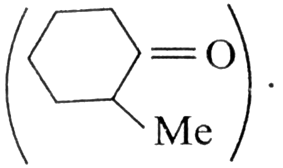
Answer: (*b*, *c*, *d*)

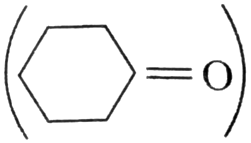
View Text Solution

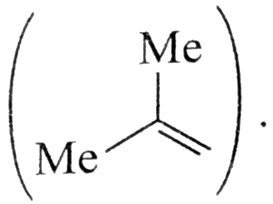


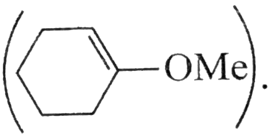
6.

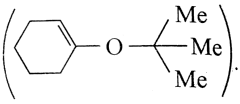
The products (*I*) and (*II*) are:

A. (*i*) is 2 - methyl cyclohexanone 

B. (*II*) is a mixture of cyclohexanone 

and 2 - methyl propne 

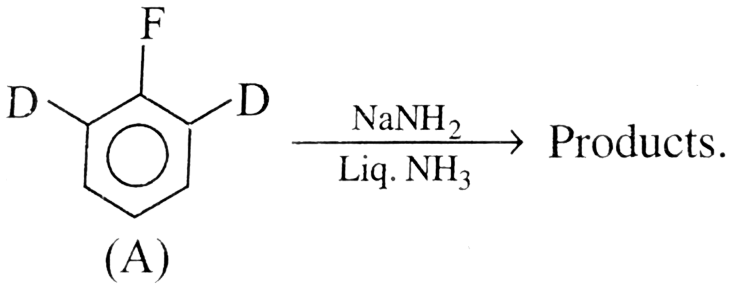
C. (I) is 1 - methoxy cyclohexene 

D. (II) is t - butoxy cuyclohexerne 

Answer: (a, b)

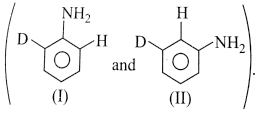
Watch Video Solution

7.



Which of the following statements are correct for the above reaction?

A. The product is a mixture of



B. The product (II) is a cine-substituation product.

C. The reaction proceeds via benzene interdiate

D. The reaction is $ArSN$ (addtion -elimination).

Answer: (a, b, c)

Watch Video Solution

8. Refer to Q. No. (8) above. Which statements is/are correct ?

A. Both reactions (i) and (ii) proceed via SN^2 mechanism.

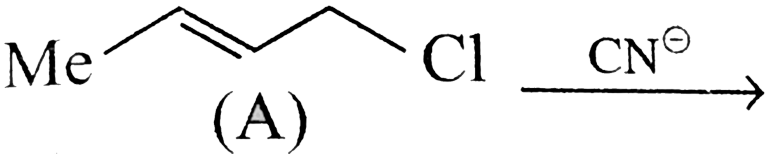
B. Both reactions (i) and (ii) proceed vai SN^1 mechanism.

C. Reaction (i) proceeds via SN^1 and reaction (ii) via SN^2 mechanism.

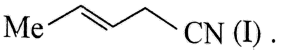
D. Reaction (i) proceeds bia SN^2 and reaction (ii) via SN^1 mechanism.

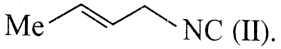
Answer: d

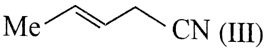
View Text Solution

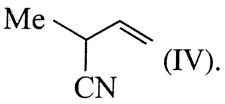
9. 

select the correct statements

A. The product is 

B. The product is 

C. The product is a mixture of 



D. The product is a mixture of (*I*) and (*II*)

Answer: *c*

Watch Video Solution

10. Refer to Q. No. 10. Which of the following statements are correct?

A. Formationof (I) and (II) proceeds via SN^1 mechanism.

B. Formation of (I) and (II) proceeds via SN^2 mechanism.

C. Formation of (III) proceeds via SN^2 mechanism.

D. Formation of (IV) proceds via SN^2 mechanism with allylic rearrangment and is called SN^2 - prime $\left(SN^2\right)$ mechanism.

Answer: (c, d)

View Text Solution

11. Which of the followig statements are correct about the reactivities of $(I)n$ - propyl chloride and (II) allyl chloride.

A. Rate of SN^1 reaction of $(I) > (II)$

B. Rate of SN^1 reaction of $(II) > (I)$

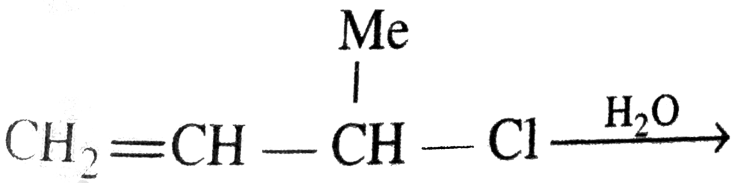
C. Rate of SN^2 reaction of $(I) > (II)$

D. Rate of SN^2 reaction of $(II) > (I)$

Answer: (*b*, *d*)

Watch Video Solution

12.



(A)

Whichof the following statemetns are correct ?

A. The product is $CH_2 = CH - \overset{Me}{\underset{|}{CH}} - OH(I)$ (major)

B. The product is a mixture of (I) and $HO - CH_2 - CH = CH - Me(II)$ (major).

C. Allyl chloride is reactive both by SN^1 and SN^2 mechanism but more reactive by SN^1 mechanism.

D. Fromation of (II) takes place by an allylic rearrangement.

Answer: (*b*, *c*, *d*)

Watch Video Solution

13. Which of the following statements are correct about Friedel-Crafts reaction?

A. It is an aromatic electrophilic sucsituaction reaction.

B. The reaction intermediate is an $\bar{e}'s$ deficient species.

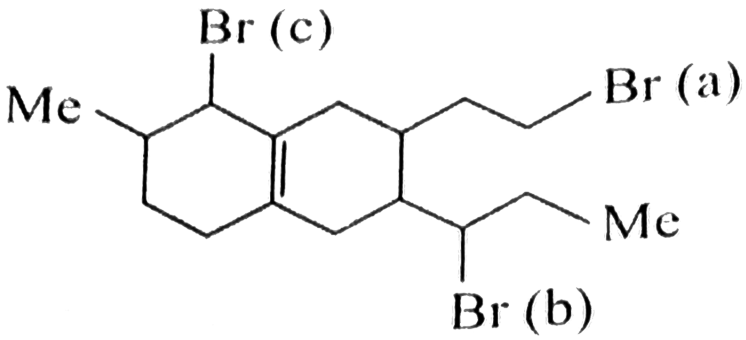
C. The reacation involves alkylation and aclation.

D. A Lewis acid is used as a catalyst.

Answer: (a, c, d)

Watch Video Solution

14. Consider the following compound:



Which of the following staements are correct?

A. Loss of $Br(a)$ atom in dehydrobrobromination reaction results in the formation of the most reactive double bond towards hydrogentaion reaction.

B. Removel of $Br(c)$ atom results in the formaion of the most stable carbocation.

C. The above compound conatins five asymmetric C atoms.

D. The above compound does not show geometrical isomers.

Answer: (a, b, c)

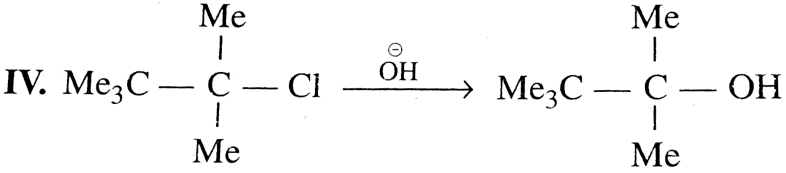
Watch Video Solution

15. Consider the following reactiions:

I. $Me_3C—F \xrightarrow{H_2O/H^{\oplus}} Me_3C—OH$

II. $Me_3C—F \xrightarrow{\ominus OH} Me_3C—OH$

III. $Me_3C—Cl \xrightarrow{\ominus OH} Me_3C—OH$

IV.


Which of the staements are correct?

A. Reaction (*I*) is faster than (*II*).

B. Reaction (*II*) is faster than (*I*).

C. Reaction (*III*) is faster than (*IV*).

D. Reaction (*Iv*) is faster than (*III*).

Answer: (*a*, *d*)

Watch Video Solution

16. Which of the following reactions are both sterospecific and steroselective ?

A. SN^1

B. SN^2

C. $E1$

D. $E2$

Answer: (*b*, *d*)

View Text Solution

17. Which of the following reactions(s) is/are both non-sterospecific but steroselective ?

A. SN^1

B. $E1$

C. $E2$

D. $ElcB$

Answer: b

View Text Solution

18. Which of the following reactions(s) is/are sterospecific but non-steroselcetive?

A. SN^2

B. $E1$

C. $E2$

D. $ElcB$

Answer: d

View Text Solution

19. Which of the following reaction(s) is/are neither sterospecific nor steroselective?

A. SN^1

B. SN^2

C. $E2$

D. $ElcB$

Answer: a

View Text Solution

20. The first steps of SN^1 and SN^2 recatiosns are, respectively

A. Both exothermic

B. Both endotherimic

C. Endothermic and exothermic

D. Exothermic and endothermic

Answer: c

View Text Solution

21. Which of the following staements are correct about $ElcB$ reaction ?

A. It proceeds via the formation of carbanion intermediate.

B. Strong EWG and poor leaving groups favour the reaction.

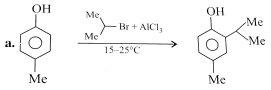
C. It is a unimolecular reaction with secound order kinetics.

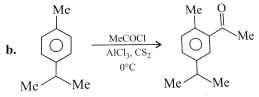
D. When D is incorporated in the staring material by the solvent $EtOD$ and the reaction is interupted before completion, no D is found either in the substrare or in the product.

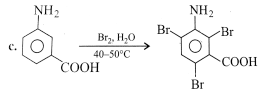
Answer: (a, b, c)

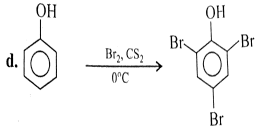
Watch Video Solution

22. In which fo the following reactions is the correct major product formed?

A. 

B. 

C. 

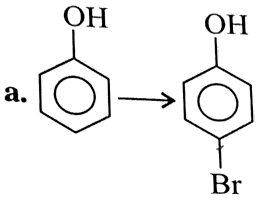
D. 

Answer: (a, b, c)

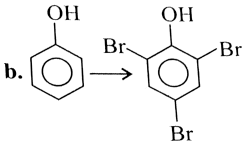
View Text Solution

23. Which of the following syntheses could not be doen without involving blocking positions on the ring?

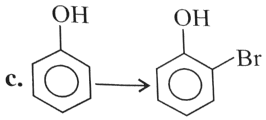
A.



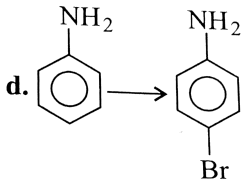
B.



C.



D.



Answer: *c*

View Text Solution

24. Which of the following side chain reaction/s can be used to reduce the acitivating group such as (- OH) or $\left(- NH_2 \right)$.

A. Benxolation

B. Acetylaction

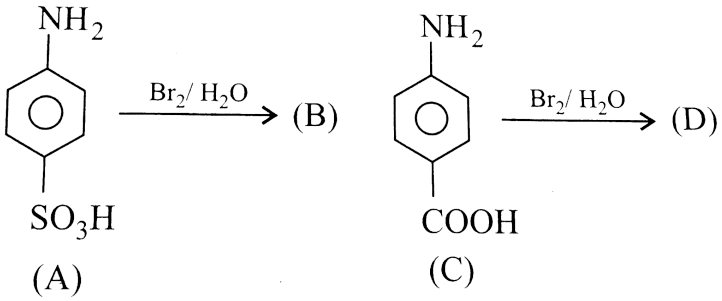
C. Tosylation

D. Sulphonation

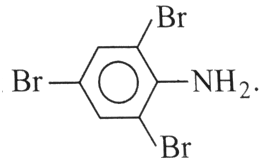
Answer: (a, b, c)

View Text Solution

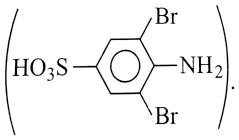
25. In the following reactions:

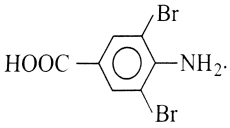


Which of the following staements are correct about the above reactions?



A. (B) and (D) are the same product

B. 

C. 

D. The above reaction is called ipso substiution.

Answer: (a, b)

Watch Video Solution

26. Which are the sources of phenol?

A. Cumene

B. Hydrolysi of benzene diaxonium salt

C. Middle oil of coal tar distilation

D. Reaction of diazonium salt with H_3PO_2

Answer: (a, b, c)

Watch Video Solution

27. Which contenet (s) of middle oil separate on cooling?

A. Napthalene

B. Phenol

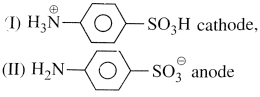
C. Benzene

D. Pyride

Answer: a

Watch Video Solution

28. Sulhanillic acid at $pH = 2$ and 12 exists as....and migrates towards..... Respectivelty.

A. 

B. (II) anode and (I) carhode

C. At both pH, only (I) and migrates towards the cathode

D. At both pH, only (II) and migrates towards the anode

Answer: a

Watch Video Solution

29. Consider the following reactions:

I. C_(2)H_(5) - I + NH_(3) rarr C_(2) H_(5) N^(o+)H_(3) + I^(o-)$II.$ C_(2)H_(5) - I + ddot(P)H_(3) rarr C_(2)H_(5) P^(o+)H_(5)+I^{o-}

III. $C_2H_5 - I + EtO^{o-} \rightarrow C_2H_5 - Oet + I^{o-}$

IV. $Me - \overset{\oplus}{S} - Me_2 + O^{o-}H \rightarrow Me - OH + Me_2S$

In which of the above reactions does not the rate of SN^2 reactions increases in solvent polarity?

A. (I)

B. (II)

C. (III)

D. (IV)

Answer: (a, b)

View Text Solution

30. In which of the above reactions does the rate fo SN^2 reactions decreases with an increases in solvent polarity?

A. (I)

B. (II)

C. (III)

D. (IV)

Answer: (c, d)

View Text Solution

31. Consider the folliwng reactions:

I. $Me_3C - Br \xrightarrow{H_2O + NaBr} SN^1\text{Product}$

II. $Ph_3C - Br \xrightarrow{H_2O + NaBr} SN^1\text{Products}$

Which of the folliwng statements are correct about the above reactions?

A. The products in reactions (I) and (II) are mixture of $\left(Me_3 - OH + Me_3Br\right)$ and $\left(Ph_3C - OH + Ph_3C - Br\right)$, respectively.

B. The product is (I) is $\left(Me_3C - OH\right)$ and in (II) is $\left(Ph_3C - OH + Ph_3C - Br\right)$.

C. The product in (I) is $\left(Me_3C - OH + Me_3C - Br0\right.$ and in (II) is $\left(Ph_3C - OH\right)$.

D. $Ph_3C^{\oplus}$ is more stable than $MeC^{\oplus}$.

Answer: (*b*, *d*)

Watch Video Solution

32. When benzene sullphonic acid and p - nitrophenol are treated with $NaHCO_3$. The gases relaesed, respectively, are:

A. SO_2, NO_2

B. SO_2, NO

C. SO_2, CO_2

D. CO_2, CO_2

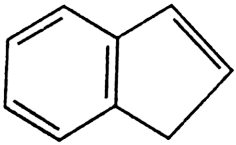
Answer: *d*

Watch Video Solution

33. The decreasing order of pK_a value of the folliwng is:

(I) $CH \equiv CH$

(II) 

(III) 

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

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

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

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

Answer: ***b***

Watch Video Solution

34. Among the following, which is/are correct?

A. Both cyclopentadiencyl anion and benzene are aromatic and have the same stabilty.

B. Benzene is aromatic and more stable than cyclopentadienyl anion and it is non-aromaitic

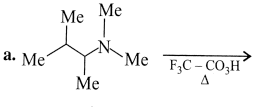
C. Both cyclopentadienyl anion and benzene are aromatic but benzene is more stable than cyclopentadienyl anion.

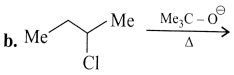
D. Cyclopentadienyl anion is more stable than benzene though both are aromatic

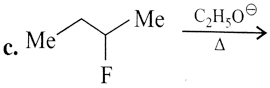
Answer: *c*

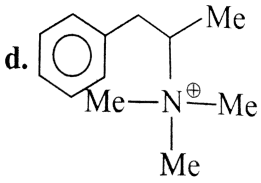
Watch Video Solution

35. Which of the following will give Hofamann alkene?

A. 

B. 

C. 

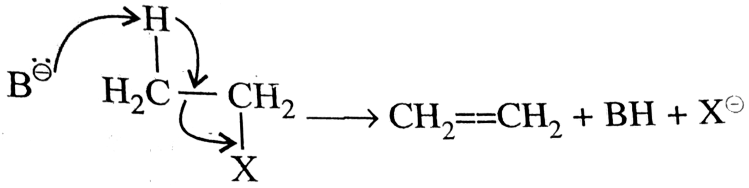
D. 

Answer: (*a*, *b*, *c*)

Watch Video Solution

Exercises Multiple Correct Answers Type

1. β - Elimination or anti-eliminination reaction is carried out with base $\left(B^{o-}\right)$ as shown below:



The following bases are used.

I. $\overset{o-}{O}H$, II. RO^{o-}

II. RO^{o-}

III. $RCOO^{o-}$, IV. $\overset{o-}{C}N$

V. NO_3^{o-}

The decreasing order of reactivity for the above elimination is:

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

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

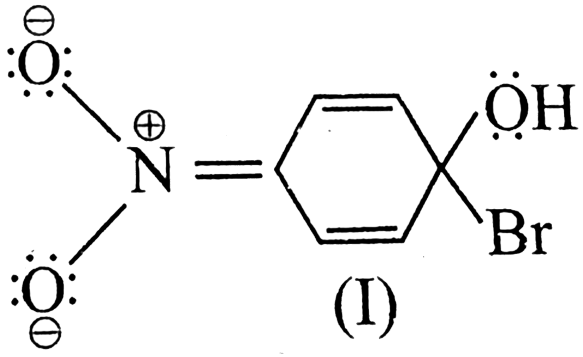
C. $(II) > (I) > (III) > (IV) > (V)$

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

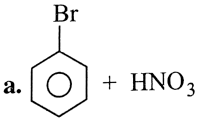
Answer: ***a***

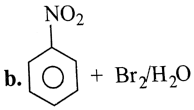
View Text Solution

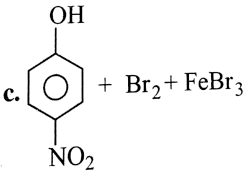
2. Which combination of recatns will not give species (I) shown as a reavitve intermedicate ?

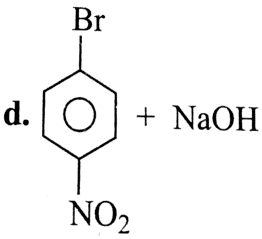


(I)

A. a.  + HNO_3

B. b.  + Br_2/H_2O

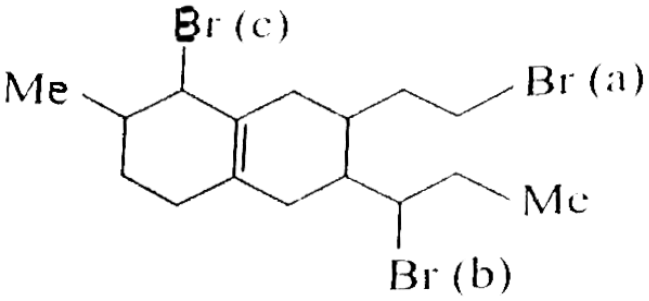
C. c.  + Br_2 + $FeBr_3$

D. d.  + NaOH

Answer: (*a*, *b*, *c*)

View Text Solution

3. Consider the following reactiions:



Which of the staements are correct?

A. Reaction (I) is faster than (II).

B. Reaction (II) is faster than (I).

C. Reaction (III) is faster than (IV).

D. Reaction (Iv) is faster than (III).

Answer: (b, d)

View Text Solution

4. Consider the following reactions:

I. $CH_3CH_2I \xrightarrow[E2]{EtO^{o-}} CH_2 = CH_2 + EtOH + I^{o-}$

II. $D_3C - CH_2I \xrightarrow[E2]{EtO^{o-}} D_2C = CH_2 + EtOD + I^{o-}$

I. $CH_3CH_2I \xrightarrow[E2]{EtO^{\ominus}} CH_2 = CH_2 + EtOH + I^{\ominus}$

II. $D_3C-CH_2I \xrightarrow[E2]{EtO^{\ominus}} D_2C = CH_2 + EtOD + I$

III. $Me_3C-I \xrightarrow[SN^1 \text{ and } E1]{EtO^{\ominus}} \underset{\text{Substitution}}{Me_3C - OEt} + \underset{\text{Elimination}}{\begin{matrix} Me \\ Me \end{matrix}\!\!>\!\!=}$

IV. $(CD_3)_3C-I \xrightarrow[SN^1 \text{ and } E1]{EtO^{\ominus}} (CD_3)_3C - OEt + \begin{matrix} D_3C \\ D_3C \end{matrix}\!\!>\!\!=CD_2$

Which of the following statement9s) is/are correct?

A. Reactions (*I*) and (*II*) show primary kinetic istope effect, whereas reactions (*III*) and (*IV*) show 2° kinetic isotope effect.

B. Reactions (*I*) and (*II*) show 2° kinetic isotope effect, whereas reactions (*III*) and (*IV*) show 1° kinetic isotope effect.

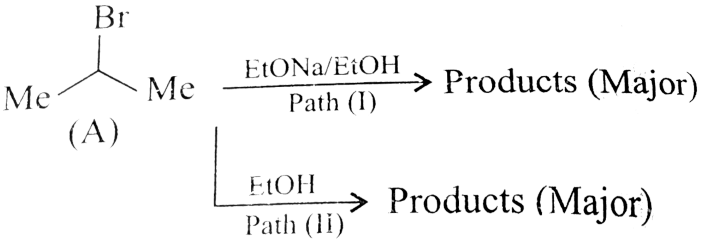
C. All reactions show 1° kinetic isotope effect.

D. All reactions show 2° kinetic isotpe effect.

Answer: a

View Text Solution

5. Consider the following reactions.



Which staements(s) is/are wrong.

A. The product by path (I) is Me - $CH = CH_2(I)$

B. The product by path (II) is Me - $CH(OE)Me(II)$

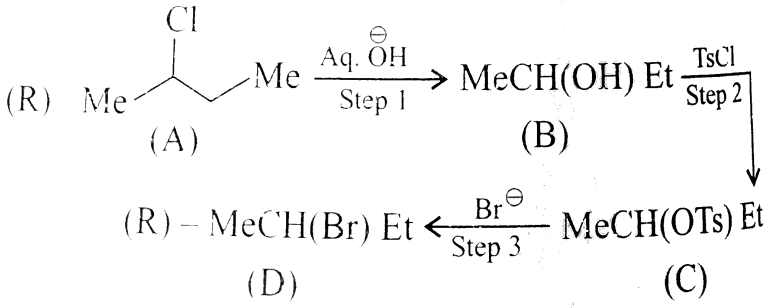
C. The products are mixture of (I) and (II) by both paths.

D. Path I proceeds cia $E2$ mechanism, while path II proceeds via SN^1 mechanism.

Answer: c

View Text Solution

6. In the conversation of optically active (R) from of 2 - chlorobutane to (R) from of 2 - bromobutane the following sequence of reactiosn is cariied out.ltbgt



Direct conversion is not feasible since *Cl* cannot be replaced by *Br* in one step.

In which of the following steps soes the inversion occur?

A. Step 1

B. Step 2

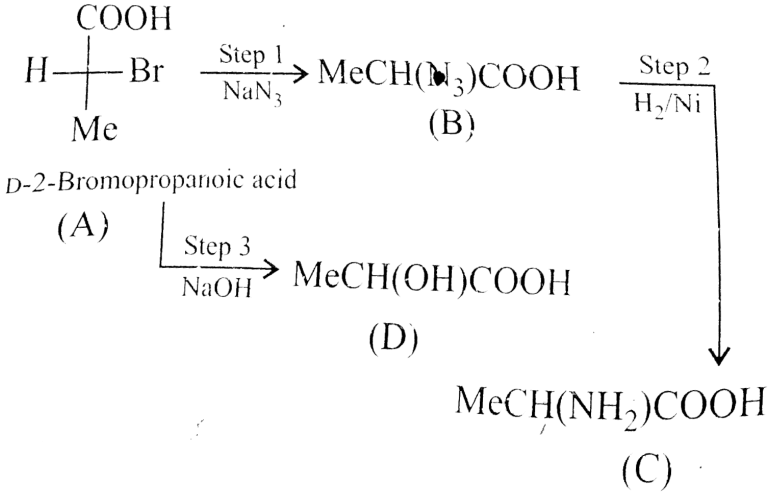
C. Step 3

D. Step 4

Answer: (a, c)

View Text Solution

7. In which of the following steps does inversion occur?



A. Step 1

B. Step 2

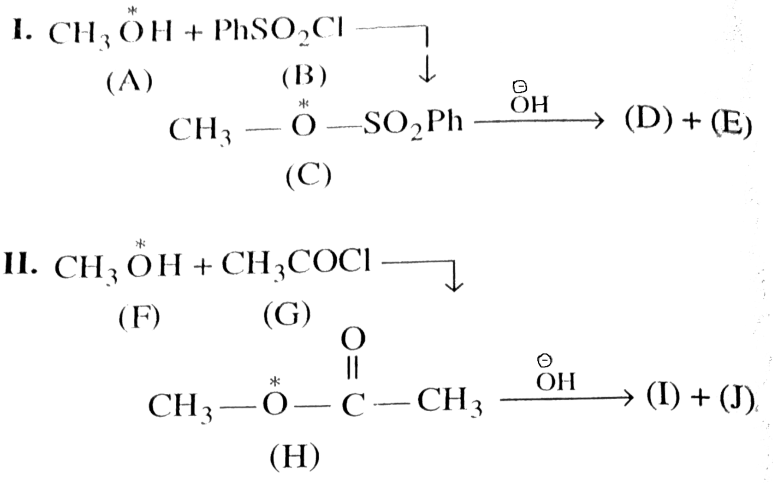
C. Step 3

D. None

Answer: (a, c)

View Text Solution

8. Consider the following reactions.



The products (D), (E), (I) and (J) are respectively.

A. $(D) = CH_3OH, (E) = PhSO_2O^*Na, (I) = CH_3O^*H, (J) = CH_3COONa$

B. $(D) = CH_3O^*H, (E) = PhSO_2Na, (I) = CH_3OH, (J) = CH_3CO\overset{*}{O}Na$

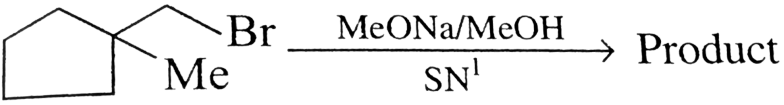
C. $\left(D0 = CH_3O^{*}H,\ (E) = PhSO\_(2)Na,\ (I) = CH\_(3)\ O\^{}(**)H,\ (J) =\right.$

$CH\_(3)COONa`$

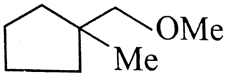
D. $(D) = CH_3OH, (E) = PhSO_2O^{*}Na, (I) = CH_3OH, (J) = CH_3C\overset{*}{O}ONa$

Answer: a

View Text Solution

9. 

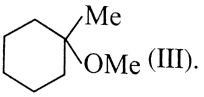
Which of the following statemetns are correct?

A. The product is 

(I). ,(I)

B. The product is 

(II). ,(II)

C. the product is a mixture of (II) + 

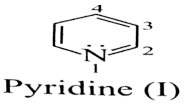
(II) + (III). ,(III)

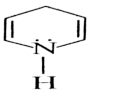
D. Product (II) is formed by $1.2Me$ shift and product (III) si formed by $1.2H^{o-}$ shift ring expansion.

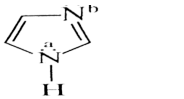
Answer: (b, c, d)

View Text Solution

10.







Which of the following statemetns are true?

A. (I) and (III) are modest Bronsted bases, wheraes (II) is not.

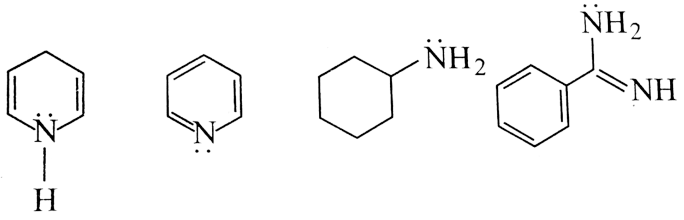
B. In (III), N^a in more basic than N^b.

C. When (II) is protaoned in the presence of a strong acid, protonation occurs at C - 2.

D. All the nitrogen present in (I), (II) and (III) are sp^2 hybridised.

Answer: (a, c, d)

View Text Solution

11. 

Which of the following statemetns are correct?

A. (I) and (II) are aromatic and have equla basic strength.

B. (I) is aomatic, (II) is anti-aromatic , but (II) is a stronger base than (I).

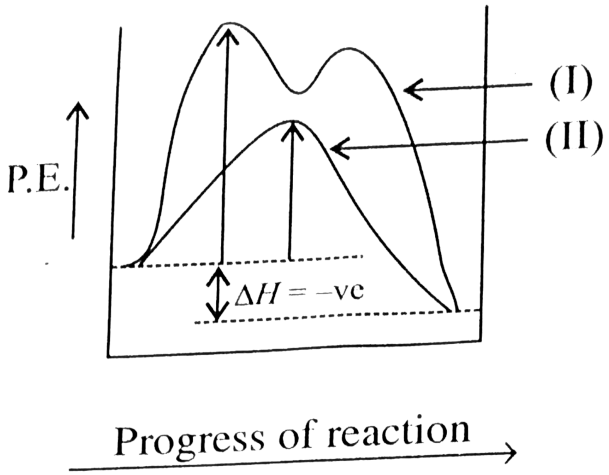
C. The basically order of above compounds is $(IV) > (III) > (II) > (I)$

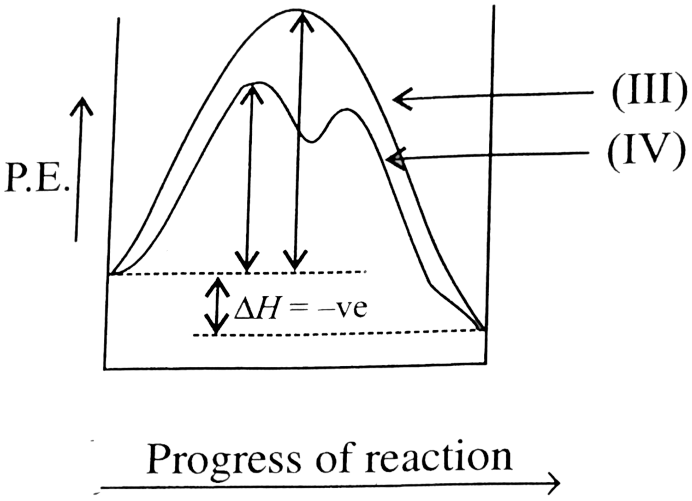
D. The conjuge acid of (IV) is more stabised than the conjugate acid of (II).

Answer: (c, d)

View Text Solution

12. Energy diagram of SN^1 and SN^2 reactions. The order of hydrolysis of RX by SN^1 is $3^\circ > 2^\circ 1^\circ RX$ and by SN^2 path is $1^\circ > 2^\circ > 3^\circ RX$.





A. (*I*) is Fig, (*a*) and (*IV*) in Fig, (*b*) represent SN^1 reaction.

B. (*II*) in Fig. (a) and (III) $\in$ *Fig*(*b*)*nrepresent*SN^(2)` reaction.

C. Fig (a) and Fig (b) are the energy diagrams for $1^{\circ} RX$ and $3^{\circ} RX$, respectively.

D. Fig (a) and Fig (b) are the energy diagram for $3^{\circ} RX$ and $1^{\circ} RX$, respectively.

Answer: (a, b, c)

View Text Solution

Exercises Single Correct

1. The decreaing order of the rate of niration of the following compounds is

I. Benzene, II. C_6D_6

III. Nitrobenzene, IV Chlorobenzene

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

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

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

D.

Answer: c

Watch Video Solution

2. The decreasing order of the rate of bromination of the following compounds is:

I. $PhN^{\oplus}Me_3$, II. $PhCH_2\overset{N}{Me}_3$

III. $PhMe$, IV. $PhMe_2$

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

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

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

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

Answer: b

Watch Video Solution

3. The decreasing order of aromaticity fo the following is

I. Benzene, II. Napthalene, III. Anthrance

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

B. (IIII) gt (II) gt (I)`

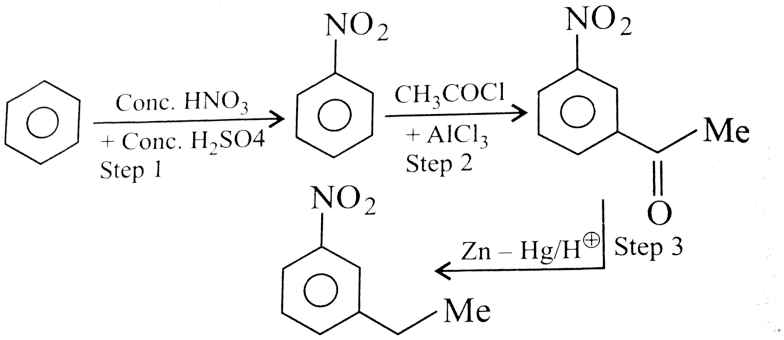
C. $(II) > (I) > (III)$

D. $(II) > (IIII) > (I)$

Answer: a

View Text Solution

4. In the following reaction, which of the folliwing steps is wrong?



A. Step 1

B. Step 2

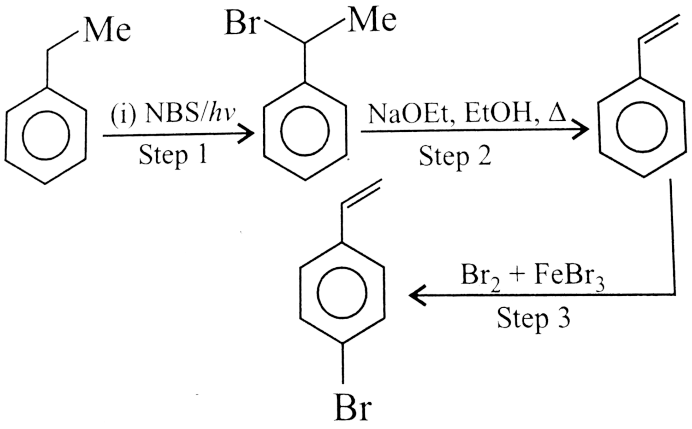
C. Step 3

D. None

Answer: ***b***

Watch Video Solution

5. In the following reaction, which of the folliwing steps is wrong?



A. Step 1

B. Step 2

C. Step 3

D. None

Answer: *c*

Watch Video Solution

6. Nitration of xylene gives only one mono-nitro derivaties. Which xylene is it?

A. orhto

B. meta

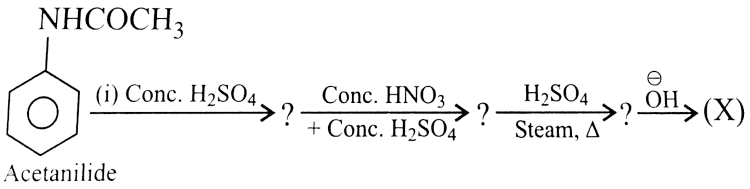
C. para

D. Both o and p

Answer: c

View Text Solution

7. The final product (X) in the following reactionis: $NHCOCH_3$



A. 2 - Nitroaniline

B. 3 - Nitroaniline

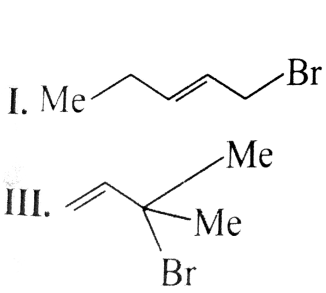
C. 4 - Nitroaniline

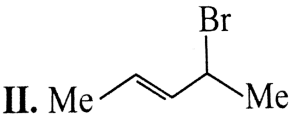
D. Sulphanilic acid

Answer: *a*

Watch Video Solution

8. Which of the following halides will be most reactive in SN^2 reaction and SN^2 reaction respectively?





A. (I), (II)

B. (II), (I)

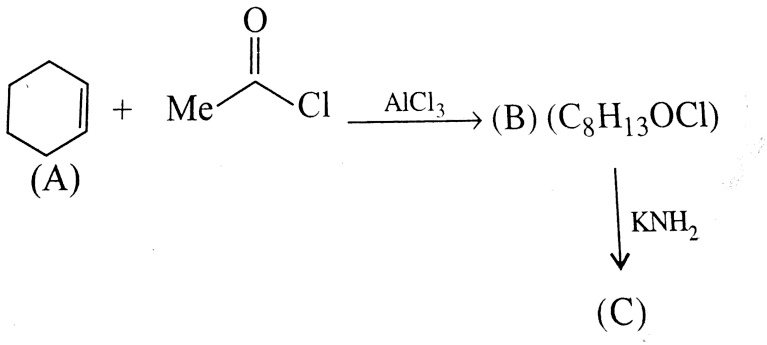
C. (I), (III)

D. (*III*), (*I*)

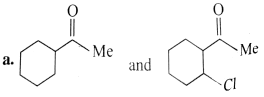
Answer: *c*

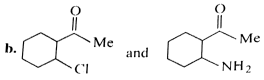
Watch Video Solution

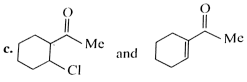
9.

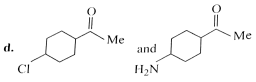


Compounds (*B*) and (*C*) respectively are:

A. 

B. 

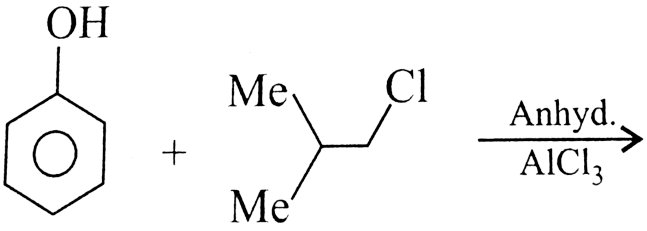
C. 

D. 

Answer: *c*

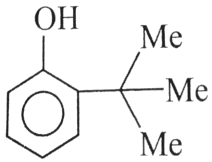
Watch Video Solution

10. Give the major product of the folliwng reaction.



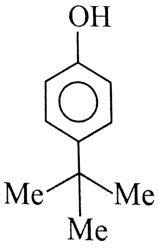
A.

a.

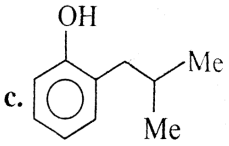


B.

b.

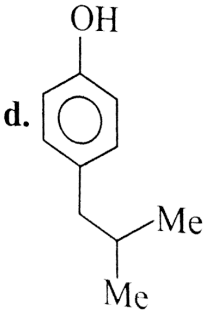


c.



C.

d.

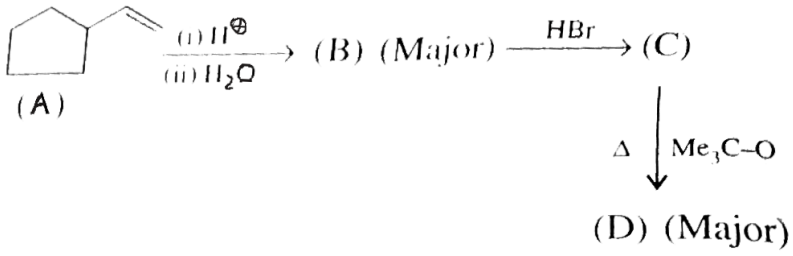


D.

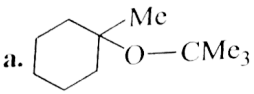
Answer: *b*

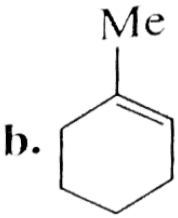
Watch Video Solution

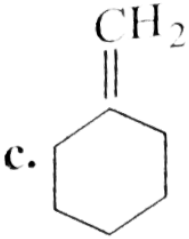
11.

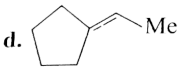


Compound (*D*) is:

A. 

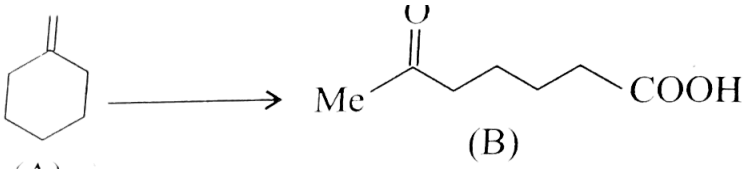
B. 

C. 

D. 

Answer: *c*

Watch Video Solution



(A) (B)

12.

The above conversion can be carried out by which process.

A. i. HBr + peroxide, $ii.$ Me_(3)CO^(o-), Delta, iii, O_(3)//H_(2)O`

B. $i.\ HBr,\ ii.\ C_2H_5O^{o-},\ \Delta,\ iii.\ O_3/H_2O$

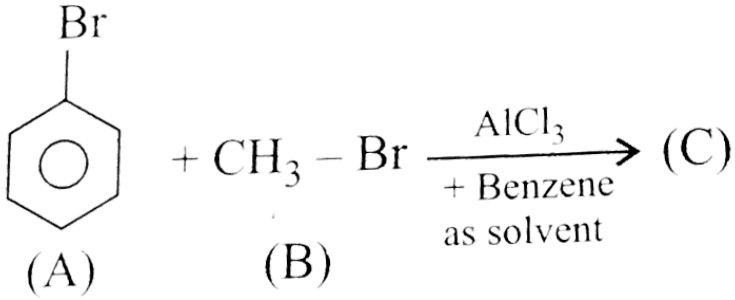
C. $i.\ Hl,\ ii.\ MeO^{o-},\ \Delta,\ iii.\ O_3/Zn$ acid

D. HCl + peroxide

Answer: *b*

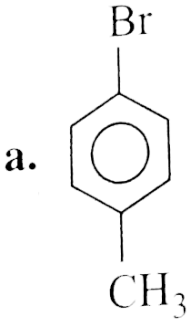
Watch Video Solution

13.

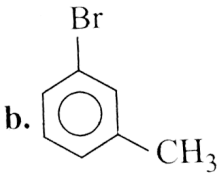


Product (*C*) is:

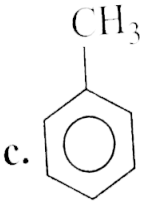
A.



B.



C.

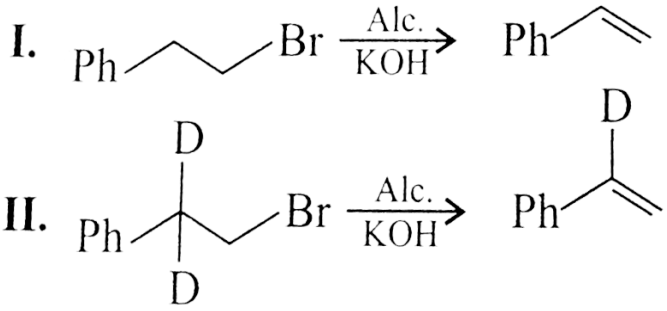


D.

Answer: c

Watch Video Solution

14. In the follwing reactionsL



the rate of reaction (I) and (II) are some. Both reactions proceeds by which mechanism.

A. $E1$

B. $E2$

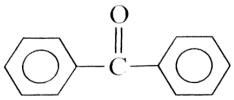
C. $ElcB$

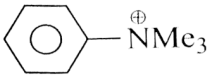
D. Anti-elimination

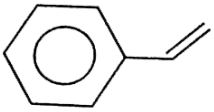
Answer: a

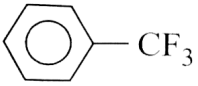
Watch Video Solution

15. In which case will SE not be in m - position?

A. a. 

B. b. 

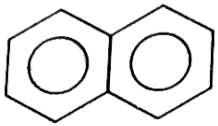
C. c. 

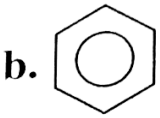
D. d. 

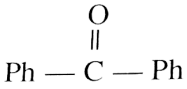
Answer: a

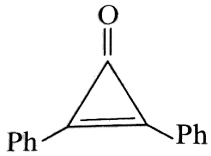
View Text Solution

16. Which of the folliwng has the highest dipole moment?

A. a. 

B. b. 

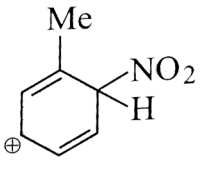
C. c. 

D. d. 

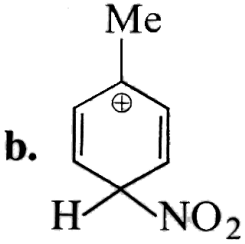
Answer: ***d***

View Text Solution

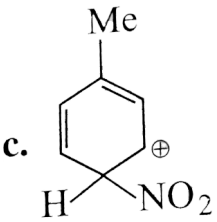
17. Which of the following is the most stable areonium or benzenium ion?

A. a. 

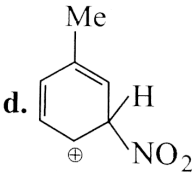
B.



C.



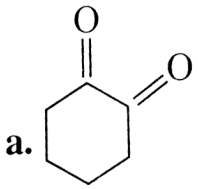
D.



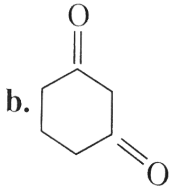
Answer: ***b***

View Text Solution

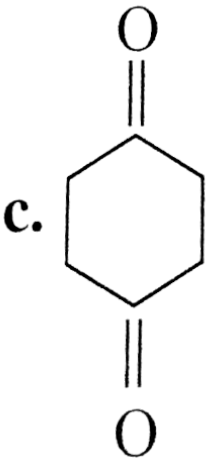
18. Which of the following ketonic compound is the least stable?



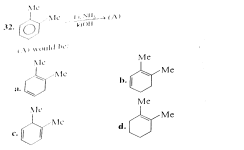
A.



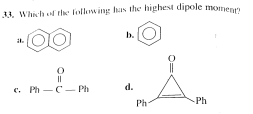
B.



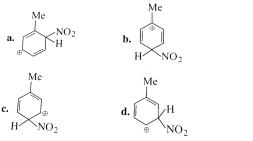
C.



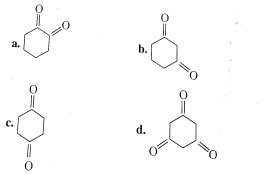
33. Which of the following has the highest dipole moment?



34. Which of the following is the most stable arenonium ion?



35. Which of the following ketonic compound is the least stable?



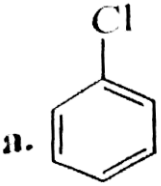
D.

Answer: *d*

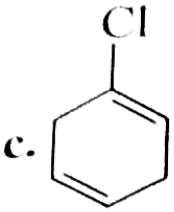
View Text Solution

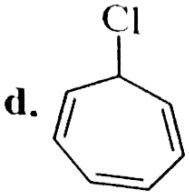
19. Which of the following compounds will give curdy precipate with $AgNO_3$ solution?

A.



B. b. $CH_2=CH-Cl$

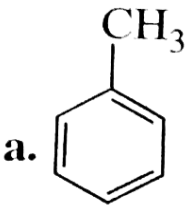
C. c. 

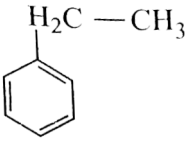
D. d. 

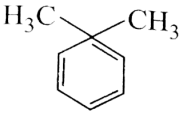
Answer: *d*

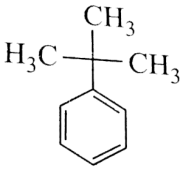
View Text Solution

20. Which of the folliwng compounds is the most reactive towards electrophilic substitution reaction?

A. a. 

B. b. 

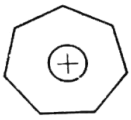
C. c. 

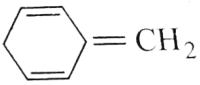
D. d. 

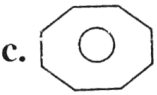
Answer: *a*

View Text Solution

21. Which of the folliwng is the most stable species?

A. a. 

B. b. 

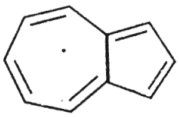
C. c. 

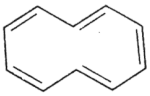
D. d. 

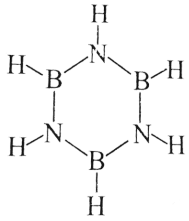
Answer: *a*

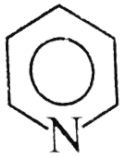
View Text Solution

22. Which of the following in not aromatic in nature?

A. a. 

B. b. 

C. c. 

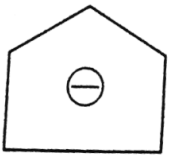
d. 

D.

Answer: ***b***

View Text Solution

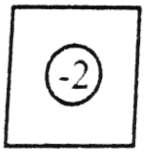
23. Which of the following species will be least stable?

a. 

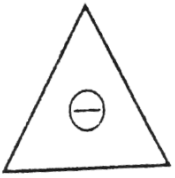
A.

b. 

B.

c. 

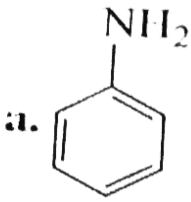
C.

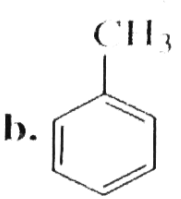
D. d. 

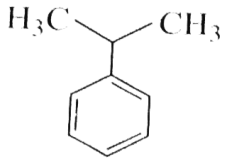
Answer: *d*

View Text Solution

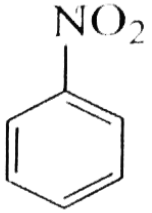
24. Which of the follwing compounds will undergo Friedel Creadfts alylation with faster rate?

A. a. 

B. b. 

c. 

C.

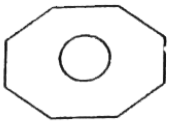
d. 

D.

Answer: ***b***

View Text Solution

25. Which of the following is anti-aromatic in nature?

a. 

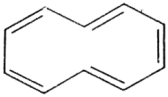
A.

b. 

B.

c. 

C.

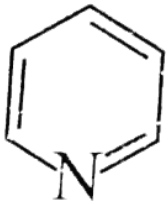
d. 

D.

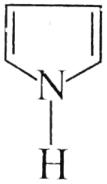
Answer: ***b***

View Text Solution

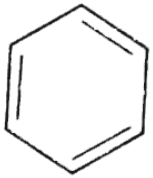
26. Which of the following aromatic compounds is least reactive towards electrophilic substituions?

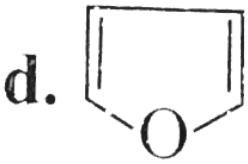
a. 

A.

b. 

B.

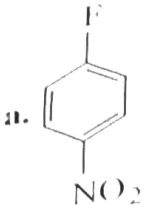
C. 

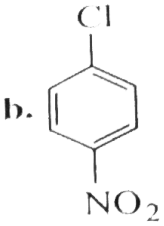
D. 

Answer: a

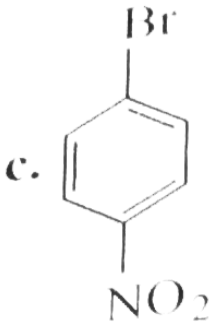
View Text Solution

27. Which of the folliwng compounds will show faster $ArSN^2$ reactions?

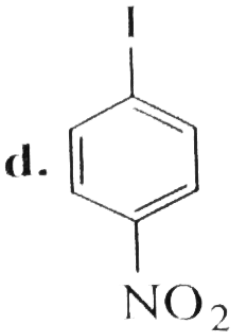
A. 

B. 

C.



D.



Answer: *a*

View Text Solution

28. Which of the folliwng is the order of the rate of reaction of C_6H_6, C_6D_6, and C_6T_6 towards sulphonation?

A. Same rates of reactions of C_6D_6, C_6D_6 and C_6T_6.

B. $C_6T_6 > C_6D_6 > C_6H_6$

C. $C_6H_6 > C_6D_6 > C_6T_6$

D. $C_6H_6 > C_6D_6 = C_6T_6$

Answer: c

View Text Solution

29. Which of the folliwng is the correct order of the order of the rate of reaction of C_6H_6, C_6D_6 and C_6T_6 towards nitration?

A. $C_6H_6 > C_6D_6 > C_6T_6$

B. $C_6H_6 = C_6D_6 = C_6T_6$

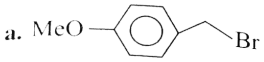
C. $C_6H_6 > C_6D_6 = C_6T_6$

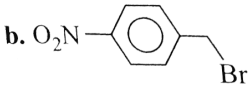
D. $C_6T_6 > C_6D_6 > C_6H_6$

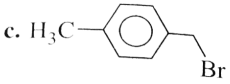
Answer: b

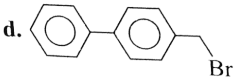
View Text Solution

30. Which of the following will give SN^2 mechanism?

A. 

B. 

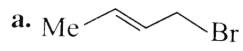
C. 

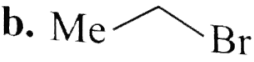
D. 

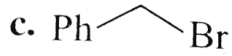
Answer: ***b***

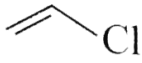
View Text Solution

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

A. 

B. b. 

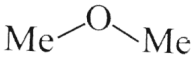
C. c. 

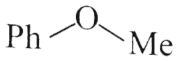
D. d. 

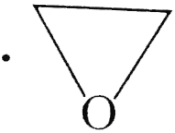
Answer: *a*

View Text Solution

32. Which of the folliwning ether wil always give SN^2 mechanism in acidic as well as basic conditions?

A. a. 

B. b. 

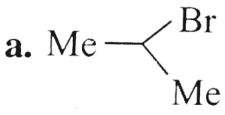
C. c. 

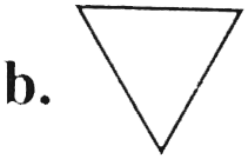
D. All

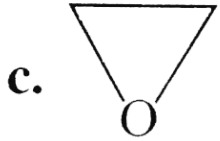
Answer: d

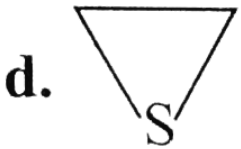
View Text Solution

33. Which of the follwoign ether will always give SN^2 mechanism in acidic as well as basic conditions?

A. **a.** 

B. **b.** 

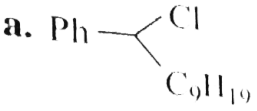
C. **c.** 

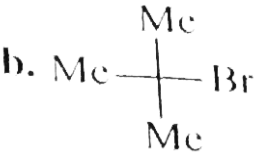
D. **d.** 

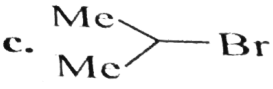
Answer: *d*

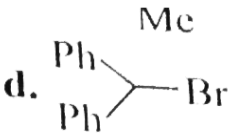
View Text Solution

34. Which of the following substrates will gave racemised product?

A. 

B. 

C. 

D. 

Answer: *a*

View Text Solution

35. The energy of activation is lowest for which reaction?

A. $RCH_2O^{\oplus}H_2 \rightarrow RC^{\oplus}H_2$

B. $R_2CHO^{\oplus}H_2 \rightarrow R_2C^{\oplus}H$

C. $R_3C\text{-}O^{\oplus}H_2 \rightarrow R_3C^{\oplus}$

D. All have the same energy of activation.

Answer: *c*

View Text Solution

36. Isopentane on monochlorination gives....isomers and out of them ..... Are optically active.

A. 3, 1

B. 4, 2

C. 3, 2

D. 4, 1

Answer: c

View Text Solution

37. Propane on dichlorinatin gives.....isomers and out of them .....are optically active.

A. 4, 1

B. 3, 1

C. 4, 2

D. 3, 2

Answer: a

View Text Solution

38. A soltuion of (+ 2) - 2 - chloro - 2 - phenylethan in toulene racemises slowly in the presence of a small amount of $SbCl_5$. Due to the formaiton

of:

A. Carbanion

B. Carbene

C. Free-radical

D. Carbocation

Answer: d

View Text Solution

39. The number of isomers for the compounds with molecular formula $C_2BrClFI$ is:

A. 3

B. 4

C. 5

D. 6

Answer: d

View Text Solution

40. The decreasing basic order of the following compounds is:

i. NH_3, ii. PH_3, iii. AsH_3, iv. SbH_3

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

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

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

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

Answer: a

View Text Solution

41. The decreasing nucleophilic order of the following compounds is:

i. NH_3, ii. PH_3, iii. AsH_3, iv. SbH_3

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

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

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

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

Answer: ***b***

View Text Solution

42. The decreasing nucelophilic order of the following compounds is:

i. NH_3, ii. PH_3, iii. AsH_3, iv. SbH_3

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

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

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

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

Answer: ***b***

View Text Solution

43. The decreasing basic order of the following is:

i. F^{o-}, ii. Cl^{o-}, iii. Br^{o-}, Iv. I^{o-}

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

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

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

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

Answer: ***a***

View Text Solution

44. The decreasing nucleophillic order fo the following compounds is:

i. F^{o-}, ii. Cl^{o-}, iii. Br^{o-}, Iv. I^{o-}

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

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

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

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

Answer: *b*

View Text Solution

45. The decreasing leaving group order of the following is:

i. F^{o-}, ii. Cl^{o-}, iii. Br^{o-}, Iv. I^{o-}

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

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

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

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

Answer: *b*

View Text Solution

46. The decreasing basic order of the following is:

i. $\overset{o-}{C}H_3$, ii. $\overset{o-}{N}H_2$, iii. $\overset{o-}{O}H$, iv. F^{o-}

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

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

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

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

Answer: a

View Text Solution

47. The decreasing nucleophilic oder of the following compounds is:

i. $\overset{o-}{C}H_3$, ii. $\overset{o-}{N}H_2$, iii. $\overset{o-}{O}H$, iv. F^{o-}

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

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

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

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

Answer: ***a***

View Text Solution

48. The deecreasing leaving group order of the following compounds is:

i. $\overset{o-}{C}H_3$, ii. $\overset{o-}{N}H_2$, iii. $\overset{o-}{O}H$, iv. F^{o-}

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

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

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

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

Answer: ***b***

View Text Solution

49. The decarising basic order of the following is:

i. $F_3CSO_3^{o-}$, ii. Cl_3C - COO^{o-}

iii. $PhSO_3^{o-}$, iv. $MeSO_3^{o-}$

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

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

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

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

Answer: c

View Text Solution

50. The decresing nuclephilic order of the following is:

i. $F_3CSO_3^{o-}$, ii. Cl_3C - COO^{o-}

iii. $PhSO_3^{o-}$, iv. $MeSO_3^{o-}$

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

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

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

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

Answer: c

View Text Solution

51. The decreasing leaving group order of the following is:

i. $F_3CSO_3^{o-}$, ii. $Cl_3C - COO^{o-}$

iii. $PhSO_3^{o-}$, iv. $MeSO_3^{o-}$

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

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

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

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

Answer: d

View Text Solution

52. The decreasing basic order of the following compounds is:

i. H_2O, ii. H_2S, iii. H_2Se, iv. H_2Te

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

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

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

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

Answer: ***a***

View Text Solution

53. The decasing nucleophilic order of the following compounds is:

i. H_2O, ii. H_2S, iii. H_2Se, iv. H_2Te

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

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

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

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

Answer: ***b***

View Text Solution

54. The decreasing leaving group order (fugacity order) of the following compounds is:

i. H_2O, ii. H_2S, iii. H_2Se, iv. H_2Te

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

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

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

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

Answer: ***b***

View Text Solution

55. The decreasing basic order of the following is:

i. overset(o-)(C)H_(3), *ii*. $Overset(o\ -\ )(O)H$, iii. CH_3COO^{o-}, iv. H_2O

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

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

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

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

Answer: a

View Text Solution

56. The decreasing nucelophilic order of the following compounds is:

i. overset(o-)(C)H_(3), *ii*. $Overset(o\ -\ )(O)H$, iii. CH_3COO^{o-}, iv. H_2O

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

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

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

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

Answer: ***a***

View Text Solution

57. The decrasing fugacity order of the following compounds is:

i. overset(o-)(C)H_(3), *ii*. $Overset(o\ -\ )(O)H$, iii. CH_3COO^{o-}, iv. H_2O

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

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

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

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

Answer: ***b***

View Text Solution

58. The decreasing basic order of the following is:

i. $PhSO_3^{o-}$, ii. $C_2H_5SO_3^{o-}$, iii. $C_2H_5COO^{o-}$, iv. $\overset{o-}{C}N$, v. $\overset{o-}{O}H$

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***

View Text Solution

59. The decreasing nucleophilic order of the following compounds is:

i. $PhSO_3^{o-}$, ii. $C_2H_5SO_3^{o-}$, iii. $C_2H_5COO^{o-}$, iv. $\overset{o-}{C}N$, v. $\overset{o-}{O}H$

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***

View Text Solution

60. The decreasing fugacity order of the following compounds is:

i. $PhSO_3^{o-}$, ii. $C_2H_5SO_3^{o-}$, iii. $C_2H_5COO^{o-}$, iv. $\overset{o-}{C}N$, v. $\overset{o-}{O}H$

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: ***b***

View Text Solution

61. The decreaing basic order of the following is:

i. $\overset{o-}{C}N$, ii. $\overset{o-}{O}H$, iii. $\overset{o-}{O}Me$, iv. $\overset{o-}{C}H_3$, v. H^{o-}

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: *c*

View Text Solution

62. The decreasing nucelophilc order of the following compounds is:

i. $\overset{o-}{C}N$, ii. $\overset{o-}{O}H$, iii. $\overset{o-}{O}Me$, iv. $\overset{o-}{C}H_3$, v. H^{o-}

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: c

View Text Solution

63. The decreasing fugacity order of the following is:

i. $\overset{o-}{C}N$, ii. $\overset{o-}{O}H$, iii. $\overset{o-}{O}Me$, iv. $\overset{o-}{C}H_3$, v. H^{o-}

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: d

View Text Solution

64. The decrasing basic order of the following is:

i. Me_2N - Nme_2, ii. $MeNH$ - $NHMe$

iii. H_2N - NH_2, iv. NH_3

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

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

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

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

Answer: ***a***

View Text Solution

65. Decreasing nucelophilic order of the following is:

i. Me_2N - Nme_2, ii. $MeNH$ - $NHMe$

iii. H_2N - NH_2, iv. NH_3

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

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

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

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

Answer: ***a***

View Text Solution

66. The decresing fugacity order of the following is:

i. Me_2N - Nme_2, ii. $MeNH$ - $NHMe$

iii. H_2N - NH_2, iv. NH_3

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

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

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

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

Answer: ***b***

View Text Solution

67. $Ph\text{ - }CH(OH)CH_3 \text{Specific rotation} = +50^\circ \xrightarrow{SOCl_2} PhCH(Cl)\text{ - }CH_3$

What si the specific rotation of the product?

A. $+50^\circ$

B. $+60^\circ$

C. -60°

D. Zero

Answer: ***b***

View Text Solution

68. Which of the following mechanisms deos the reaction proceed?

A. SN^1

B. SN^2

C. SN^i

D. $E2$

Answer: c

View Text Solution

69. Which of the following acts as a nucelphilic?

A. CI^{o-}

B. OH^{o-}

C. SO_2

D. None

Answer: a

View Text Solution

70. The reaction is carried out in the presence of pyridne, Which of the following mechanisms does it follow?

A. SN^1

B. SN^2

C. SN^i

D. $E2$

Answer: *b*

View Text Solution

71. Which of the following acts as a leaving group?

A. $\overset{\theta}{OH}$

B. Cl^{θ}

C. SO_2

D. $E2$

Answer: c

View Text Solution

72. $CH_3 - CH(Cl) - C_2H_5 \xrightarrow{Alc.KOH} CH_3 - CH = CH - CH_3$

The above reaction proceeds via $ElcB$ mechanism. Which of the followiing statements is true about $ElcB$ mechanism?

A. It is secound order and bimolecular.

B. It is first order and unimolecular.

C. It is first order and unimolecular.

D. It is secound order of unimolecular.

Answer: d

View Text Solution

73. Alkyl halides can be obtained by all methods except

A. $CH_3CH_2OH + HX/ZnCl_2$

B. $CH_2 = CH - CH_3 \xrightarrow[475K]{SO_2Cl_2(\rightarrow)}$

C. $C_2H_5OH + NaCl$

D. $CH_3COOAg + Br_2/CCl_4$

Answer: c

Watch Video Solution

74. Meopentyl chloride on reaction with ethanolic KOH is likely to give

A. Neopentyl alcohol

B. Pentylene

C. 2 - Mentyl - 2 butene

D. Undergo no reaction

Answer: d

Watch Video Solution

75. In the reaction $CH_3C \equiv \overset{\theta \oplus}{C}Na + \left(CH_3\right)_2CHCl \rightarrow$, the product formed is:

A. 4 - Methyl - 2 - pentyne only

B. Proopyne

C. Propyne and propylene

D. Mixture of propene, propyne, and 4 - methyl - 2 - penyne

Answer: d

View Text Solution

76. In order to get ethanetiol from bromoethane, the reagent used is :

A. Sodium bisulphide

B. Sodium sulphide

C. Potassium thicyanate

D. Potassium sulphide

Answer: a

Watch Video Solution

77. For the preparation of chloroethane,

A. HCl gas is passed through ethanol.

B. Ethanol is treated with thionyl chloride in the presence of dimethyl amine or pyride.

C. Ethyl sulphide is treated with hydrogen chloride.

D. Any of the above methods can be empolyed.

Answer: b

Watch Video Solution

78. X on treatment with sodium hydroxide followed by the addition of silver nitrate give white precipitate at room temperature which are soluble in NH_4OH. X can be :

A. Chlorbenzene

B. Ethyl bromide

C. Benzyl chloride

D. Vinyl chloride

Answer: c

Watch Video Solution

79. Which of the following cannot be used for the preaparation of iodofrom ?

A. Acetone

B. Methanol

C. Ethanol

D. Acetealdeyde

Answer: b

View Text Solution

80. Which of the following hladies is capable of exhibitin enantiomerism?

A. Ethyl chloride

B. Isopropyl bromide

C. sec-Butyl iodide

D. tert-Butyl chloride

Answer: c

View Text Solution

81. A suspension of $CaOCl_2$ in water is heated with ethanol, the product formed is :

A. Ethyene

B. Ethanol

C. Trichloromethane

D. Chloroenthane

Answer: c

Watch Video Solution

82. Pick up the correct statements about alkyl halides.

A. They are associated with each other by H - bonds.

B. They dissolve in water quickly.

C. They dissolve easily in organic solvents.

D. They do not contain any polar bonds in their molecules.

Answer: c

View Text Solution

83. Which of the following is a geminal dihalide ?

A. Ethylene dibromide

B. Propylidene chloride

C. Isopropyl bromide

D. None of the above

Answer: b

Watch Video Solution

84. $C_2H_5I \xrightarrow{AgNO_2}$ X. Here X (major product) is :

A. $C_2H_5 - \overset{\overset{O}{\|}}{N} \rightarrow O$

B. $C_2H_5 - O - N = O$

C. $C_2H_5 - N = O$

D. All of above

Answer: *c*

Watch Video Solution

85. Which of the following sequence would yield m-nitrochlorobenzene (Z) from benzene ?

A. Benzene $\xrightarrow{Cl_2/FeCl_3}$ (X) $\xrightarrow{HNO_3}$ $H_2SO_4(Z)$

B. Benzene $\xrightarrow{H_2SO_4/HNO_3}$ (Z)

C. Benzene $\xrightarrow{H_2SO_4/HNO_3}$ (X) $\xrightarrow{FeCl_3/Cl_2}$ (Z)

D. All of these above will produce (Z)

Answer: *c*

Watch Video Solution

86. $C_3H_7Cl \xrightarrow{KOH(alc.)} (A) \xrightarrow[770K]{Cl_2(g)} (X)$. (X) can be:

A. Vinyl chloride

B. Allyl chloride

C. Ethyl chloride

D. Ethyl isodide

Answer: ***b***

View Text Solution

87. Which of the following alkyl halides undergoes the fastest S_{N^1} reaction ?

A. Methyl chloride

B. Ethyl chloride

C. Isobutyl chloride

D. tert-Butyl chloride

Answer: ***d***

Watch Video Solution

88. Choose the incorrect reaction.

A. $2C_2H_5I + 2Na \xrightarrow{(C_2H_5)_2O} C_4H_{10} + 2NaI$

B. $2C_2H_5Br + Zn \xrightarrow{EtOH} (C_2H_5)_2Zn + Br_2$

C. $2C_2H_5Br + NaI \xrightarrow{(CH_3)_2C=O} C_2H_5I + NaBr$

D. All are correct reactions.

Answer: ***b***

View Text Solution

89. In order to convert aniline into chlorobenzene the reagents needed are

A. $CuCl$

B. $NaNO_2/HCl$ and $CuCl$

C. Cl_2/CCl_4

D. $Cl_2/AlCl_3$

Answer: ***b***

Watch Video Solution

90. The reaction between chloral and chlorobenzene in H_2SO_4 yields:

A. Chloretone

B. p, p - Dichlorodiphenyl trichloroenthane

C. o - Chlorobenzaldichloride

D. Chloralphenylchloride

Answer: b

View Text Solution

91. Under the influene of air and light chloroform decomposes into

A. CCl_4

B. $\left(CH_3\right)_2 \overset{OH}{\underset{|}{C}} - CCl_3$

C. $COCl_2$

D. $\mathbb{C}l_3CHO$

Answer: c

Watch Video Solution

92. When iofoform is heated with silver poweder, the gaseous product formed is:

A. Ehthene

B. Ethyne

C. Ethane

D. Silver iodate

Answer: ***b***

View Text Solution

93. The reaction involving the treatment of benzene diazonium chloride with copper powder and HCl is treated as

A. Sandmeyer's reaction

B. Gattermann's reaction

C. Ullmann's reaction

D. Kolbe's reaction

Answer: ***b***

Watch Video Solution

94. $C_6H_5Cl \xrightarrow[625\ \text{K}\ 300\ \text{atm}]{NaOH(aq.)}$... The product can be:

A. Benzal

B. Sodium benzote

C. Benzol

D. Sodium phenate

Answer: d

View Text Solution

95. $\left(CH_3\right)_2CHI \xrightarrow{KOH} EtOHA \xrightarrow[475K]{SO_2Cl_2} B$

The compound B in the sequence is

A. Dimethyl sulphate

B. 1, 2 - - Dichloro ethane

C. 3 - Chloro propene

D. 1 - Chloro-2 - iosopropane

Answer: *c*

Watch Video Solution

96. In given sequence of reaction predict X

$$X \xrightarrow{KOH} H_2OY \xrightarrow[633K]{Al_2O_3} Z \xrightarrow{[O]} 2 \text{ moles of } CH_3COOH$$

A. $CH_3CH_2CH(I)CH_3$

B. $CH_3CH_2CH_2CH_2I$

C. $CH_3CH(I)CH(I)CH_3$

D. $CH_3CH(I)CH_2CH_2I$

Answer: *a*

Watch Video Solution

97. Iodofrom can be prepared from:

A. Isoamyl alcohol

B. α - Phenyl ethanol

C. Isobutyl alcohol

D. β - ethanol

Answer: b

View Text Solution

98. When bromoethane is treated with potassium sulphide, the main product formed is

A. Ethanethiol

B. Ethanol

C. Mustrad gas

D. Thioethyl ethane

Answer: d

Watch Video Solution

99. $\left(CH_3\right)_2CHCl + NaI \xrightarrow{\text{Acetone}} \left(CH_3\right)_2CHI + NaCl$

The above reaction is known as :

A. Perkin's reaction

B. Finkelstein's reaction

C. Fitting reaction

D. Sabatier and Senderan's reaction

Answer: b

Watch Video Solution

100. Isopropyl alcohol is heated with a suspension of bleaching powder $\left(CaOCl_2\right)$ with water. The products are :

A. Etane and propane

B. Etyne and ethene

C. Trichloromethane and sodium accetate

D. Carbon tetrachloride

Answer: c

Watch Video Solution

101. Out of monochloro, monobromo and monoiodo derivatives of ethane, the least reactive compound towards nucleophilic substitutions will be :

A. C_2H_5Br

B. C_2H_5Cl

C. C_2H_5I

D. All are equally reactive

Answer: c

Watch Video Solution

102. Which of the following reacting substances will not liberate ethyne gas ?

A. CH_3Cl and Ag

B. CaC_2 and H_2O

C. CHl_3 and Ag

D. $CHCl_3$ and Ag

Answer: a

Watch Video Solution

103. Which of the following on reaction with chloroform will given chloretone ?

A. HNO_3

B. $\left(CH_3\right)_2C = O$

C. Chloral

D. $\left(CH_3\right)_2CHCHO$

Answer: ***b***

Watch Video Solution

104. The product formed by the reaction between 2,2,2-trichloroethanal (chloral) and chlorobenzene in H_2SO_4 is

A. Chloretone

B. DDT

C. Chlorobenzaldichloride

D. Benzene sulphonic acid

Answer: ***b***

Watch Video Solution

105. $C_6H_5Cl \xrightarrow{Ni\text{-}Al/NaOH} A$

In this reaction A is :

A. Phenol

B. Sodium phenoxide

C. Benzol

D. Benzene

Answer: d

Watch Video Solution

106. A sample of chloroform being used as anaesthetic is tested by .

A. $AgNO_3(aq.)$

B. Fehling's solution

C. $AgNO_3(ag.)$ after boiling with KOH

D. Any of the above

Answer: a

Watch Video Solution

107. Which of the following is not an example of Sandmeryer's reaction?

A. $C_6H_5N_2Cl^- \xrightarrow{CuCl} C_6H_5Cl$

B. $C_6H_5N_2Cl^- \xrightarrow{CuBr} C_6H_5Br$

C. $C_6H_5N_2Cl^- \xrightarrow{CuCN} C_6H_5CN$

D. $C_6H_5N_2Cl^- \xrightarrow{KCN} KIC_6H_5I$

Answer: d

View Text Solution

108. In order to prepare fluorobenzene from benzene diazonium chloride which of the following reagent is used

A. Flouring

B. HF

C. Hydrofluoroilicic acid

D. Fluroboric acid

Answer: d

Watch Video Solution

109. Ulimann reaction involes the use of the follwing reacants?

A. Iodobenzene and sodium

B. Benzene and copper

C. Isodonenzene and copper powder

D. Benzene diazonium chloride and Cu/HCl

Answer: c

View Text Solution

110. The yield of chlorobenzene obtained by reaction of phenols with PCl_5 is less due to formation of

A. o - Chlorophenol

B. `p- Chlorophenol

C. Phosphorous oxychloride

D. Triphenyl phosphate

Answer: d

Watch Video Solution

111. Identify C in the following series $C_3H_7I \xrightarrow{KOH} {}_{Alc}A \xrightarrow{NBS} {}_{\Delta}B \xrightarrow{KCN} {}_{Alc}C.$

A. $\left(CH_3\right)_2CH - CN$

B. $CH_2 = CH - CH_2CN$

C. $Br - CH = CH - CN$

D. $CH_2 = CH - C \mid BrHCN$

Answer: *b*

Watch Video Solution

112. Lindane can be obtained by the reaction of benzene with

A. $CH_3Cl / \text{Anthy.}\ AlCl_3$

B. $Cl_2 / \text{Sunlight}$

C. $C_2H_5I / \text{Anthy.}\ AlCI_6$

D. $CH_3COCl / AlCl_3$

Answer: *b*

Watch Video Solution

113. IUPAC name of Gammexane is

A. $C_6H_3Cl_3$

B. $C_6H_4Cl_2$

C. $C_6H_6Cl_6$

D. Diphenylrichlorocethane

Answer: c

Watch Video Solution

114. Which of the following haldies has the least dipole moment?

A. 1, 2 - Dichlorobenzane

B. Dichloromethane4

C. Trichloromethane

D. Etyl chlororide

Answer: c

View Text Solution

115. The chemical reaction :

$\left(CH_3\right)_3CBr \xrightarrow[-H_2O,\,-KBr]{KOH\,(alc.)} \left(CH_3\right)_2C = CH_2$ is and example of

A. Nucelophilic substitution

B. Electrophilic substitution

C. Free radical substituion

D. β - Elimination

Answer: d

Watch Video Solution

116. An ethereal solution of 4-Nitrochlorobenzene is treated with metallic sodium. The product formed is :

A. Aminobenzene

B. 4, 4 - Dinitrodiphenyl

C. p - Chloroaniline

D. Benzene diazonium chloride

Answer: ***b***

Watch Video Solution

117. Ethanol $\xrightarrow{P_4/I_2} X \xrightarrow[(ii)\,HBr]{(i)\,KOH\,(alc)} Y$

In this sequence of reactions Y is :

A. Ethene

B. Bromethane

C. Ethanol

D. None

Answer: ***b***

Watch Video Solution

118. Which of the folliwng haldies can yield ethan eand also methane in a single step?

A. C_2H_5Br

B. CH_2I

C. $\left(CH_3\right)_2CHBr$

D. None

Answer: ***b***

View Text Solution

119. A halide with formula $C_6H_{13}Br$ gave two isomeric alkenes A and B with formula C_6H_{12}. On reductive ozonolysis of mixture of A and B following compounds were obtained CH_3COCH_3, CH_3CHO, CH_3CH_2CHO and $\left(CH_3\right)_2CHCHO$. Thehalide is

A. 2 - Bromohexane

B. 3 - Bromo - 2 - methylpentane

C. 2, 2 - Dimethyl - l bromonhexane

D. Unpredicatable

Answer: b

Watch Video Solution

120. Fire extinguisher is:

A. CO_2

B. $\mathbb{C}l_4$

C. $CHCl_3$

D. H_2CO_3

Answer: ***b***

View Text Solution

121. Which of the following is called Westron ?

A. CH_3Cl

B. $CHCl_3$

C. $CHCl_2CHCl_2$

D. $\mathbb{C}l_2 = CHCl$

Answer: ***c***

Watch Video Solution

122. Which of the following represents Freen?

A. Acetylene tetrachloride

B. Trichlorethylene

C. Dichlordifluoromethane

D. Ethylene dichloride

Answer: *c*

View Text Solution

123. Which of the following represents. Westrosol?

A. $CHCl_3$

B. CH_2Cl_2

C. $CHCl_2CH_2Cl$

D. $\mathbb{C}l_2C = CHCl$

Answer: d

Watch Video Solution

124. Optically active isomers but not mirror images are callled

A. Enantiomers

B. Mesomers

C. Diasteromers

D. Metamers

Answer: c

Watch Video Solution

125. The process of converign one enatiomer of an optically active compound inot racemic mixture is called:

A. Resolution

B. Inversion

C. Epimerisation

D. Racemission

Answer: d

View Text Solution

126. The formation of an optically active compound from a chiral molecule is called:

A. Asymmetric syntesis

B. Resolution

C. Walden inversion

D. Epimerision

Answer: a

View Text Solution

127. Which of the following reagents will be able to disguish between allyl bromide and n - propyl bromide?

A. Aqueous $AgNO_3$

B. $NaOH, AgNO_3$

C. $Alk. KMnO_4$

D. Tollens reagent

Answer: c

View Text Solution

128. Rascing's process is employed for the commerical preparation of:

A. Ehthyl chloride

B. Grignard's regent

C. Chlorobenzane

D. Ethanol

Answer: c

View Text Solution

129. Vinyl chloride and ethyl chloride can be distingushed by

A. Lucas reagent

B. $KOH, AgNO_3$

C. $AgCl$

D. $HCl/AgCl$

Answer: b

Watch Video Solution

130. The disillation of belaching powder and acetone gives:

A. $CHC,_3$

B. Chloral

C. CH_3Cl

D. $\mathbb{C}l_4$

Answer: a

View Text Solution

131. Chlorination of methane proceeds by

A. Electrophilic substitution

B. Nucelophilic substitution

C. Free radical mechanism

D. None of these

Answer: c

Watch Video Solution

132. Aryl halides are less reactive towards nucleophilic substitution reaction as compared to alkyl halides due to

A. The foramtion of less stable carbonium ion

B. Resonance stablisation

C. Larger-carbon-halogen bond

D. Inductive effect

Answer: b

Watch Video Solution

133. How many chiral carbon atoms are present in $2.3, 4$ - trichloropentane?

A. 3

B. 2

C. 1

D. 4

Answer: b

View Text Solution

134. Carbylamine test is performed in alc . KOH by heating a mixture of :

A. Chloroform and silver powder

B. Trihalogentaded methane and a primary amine

C. An alkyl halide and a primary amine

D. An alkyl cyanide and a primary amine

Answer: b

Watch Video Solution

135. What happens when CCl_4 is treated with $AgNO_3$ solution ?

A. NO_2 is evolved

B. A white precipate of $AgCl$ is formed

C. $\mathbb{C}l_4$ wil dissolves in $AgNO_{30}$ solution

D. No reaction

Answer: d

Watch Video Solution

136. Among the following compounds the one that is most reactive towards electrophilic nitration is

A. Toluene

B. Benzonic acid

C. Nitrobenzene

D. Benzene

Answer: a

Watch Video Solution

137. Slow oxidation of chloroform in air leads to

A. Formly chloride

B. Formic acid

C. $COCl_2$

D. Trichloro acetic acid

Answer: c

Watch Video Solution

138. Reaction of t - butyl bromide with sodium methoxide produces

A. Isobutane

B. Isobutylene

C. t - Butyl methyl etiher

D. Sodium tert-butaoxide

Answer: b

Watch Video Solution

139. Which is most reactive towards Br_2 in the prsence of $FeBr_3$?

A. Anisole

B. Benzene

C. Bromolbenzene

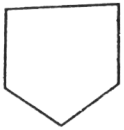
D. Nitrobenzene

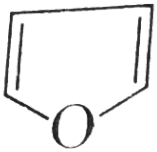
Answer: a

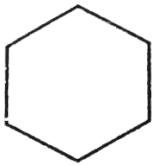
View Text Solution

140. Which of following is most easily cleaved by HBr.

A. a. 

B. b. 

C. c. 

D. d. 

Answer: *a*

View Text Solution

141. Which will react faster with NBS?

A. C_6H_6

B. CH_4

C. Toluene

D. Cyclorpropane

Answer: c

View Text Solution

142. Which is the most effective ion in an SN^2 displacement on methyl bromide?

A. $C_6H_5O^{\theta}$

B. overset(theta)(O)H`

C. $C_6H_5O^{\theta}$

D. CH_3COO^{θ}

Answer: a

View Text Solution

143. Of the following four groups are m - directing when present on a benzene ring. The one which is not meta-directing is:

A. $-COOH$

B. $-NO_2$

C. $-CHO$

D. $-NH_2$

Answer: d

View Text Solution

144. The chemistry of benzene is characterised by which fo the following types of reaction?

A. Additomn

B. Elimination

C. Polymerisation

D. Substituion

Answer: d

View Text Solution

145. A reaction involving an aromatic nucleas is usually initiated by:

A. Free radicals

B. Molecules possessing a lone pair of electrons

C. Nucelphiles

D. Eletrophiles

Answer: d

View Text Solution

146. Which of the following deactivates the aromatic nucleas?

A. $-CH_3$

B. $-Br$

C. $-NH_2$

D. $-NR_2$

Answer: ***b***

View Text Solution

147. The experimentakkt determind rate equiaction for the alkaline hydeolysis of RBr is given by:

$$\text{Rate} = K[RBr]\left[{}^{\theta}OH\right]$$

Which of the following staements is inconsists with these observations?

A. The reaction is first order with respect to RBr

B. The reaction is seound order overall

C. The reaction process is false.

D. The rate-determining step is bimolecular.

Answer: c

View Text Solution

148. Which of the follwing undergoes nitration most readily?

A. Toluene

B. Styrene

C. Chlorobenzene

D. phenol

Answer: c

View Text Solution

149. Which of the follwing reaction s is not sterospecific?

A. SN^2

B. Addition of Br_2 to ethyle3ne in $\mathbb{C}l_4$

C.

D.

Answer: c

View Text Solution

150. Which of the following on reaction with acetylene $(Ch \equiv CH)$ produce gas(es) ?

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

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

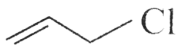
C. (II), (III), and (IV)

D. (I), (III), and (IV)

Answer: a

View Text Solution

151. Which is least reactive towards nucleophilic substitution $\left(S_{N^2}\right)$

A. a. 

B. Me_3C - Cl

C. $PhCl$

D. $MeCH(Cl)Me$

Answer: c

Watch Video Solution

152. Fluorobenzene $\left(C_6H_5F\right)$ can be synthesized in the laboratory .

A. By heating pheonal with HF and KF.

B. From aniline by diazotisation followed by heting the diazonium salt with HBF_4.

C. By direct flourinationo of benzene with F_2 gas.

D. By reacting $PhBr$ with NaF solution

Answer: b

Watch Video Solution

153. $CH_3Br + Nu^{\Theta} \rightarrow CH_3 - Nu + Br^{\Theta}$

The decreasing order of the rate of the above reaction with nucleophiles $Nu^{\Theta} A$ to D is-

$\left[N\bar{u} = (A)phO^{-}, (B)AcO^{-}, (C)H\bar{O}, (D)CH_3\bar{O}\right]$

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

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

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

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

Answer: c

Watch Video Solution

154. HBr reacts with $CH_2 = CH - OCH_3$ under anhydrous conditions at room temperature to give:

A. CH_3CHO and CH_3Br

B. $BrCH_2CHO$ and CH_3OH

C. $BrCH_2CH_2OCH_3$

D. $CH_3 - CH(Br) - OCH_3$

Answer: d

Watch Video Solution

155. The halogen compound which most readily undergoes nucleophilic substitution is

A. $CH_2 = CHCl$

B. $CH_3CH = CHCl$

C. $H_2C = CHC(Cl) = CH_2$

D. $CH_2 = CHCH_2Cl$

Answer: d

Watch Video Solution

156. The correct decreasing order of SN^1 reactivity of the folliwng is:

I. $PhCH_2X$. II. $CH_2 = CHCH_2X$

III. Me_2CHX, IV. C_2H_5X

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

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

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

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

Answer: a

View Text Solution

157. Which of the follwing has the highest boiling point?

A. C_3H_7Cl

B. C_4H_9Cl

C. $CH_3CH\left(CH_3\right)CH_2Cl$

D. $\left(CH_3\right)_3C$ - Cl

Answer: b

View Text Solution

158. Which of the following sequence of reaction (reagents) can be used for conversion of $C_6H_5CH_2CH_3$ into $C_6H_5CH = CH_2$?

A. $SOCl_2, H_2O$

B. $SO_2Cl_2, alc.\ KOH$

C. $Cl_2/hv, H_2O$

D. $SOCl_2, alc.\ KOH$

Answer: *b*

Watch Video Solution

159. The decreasing order of dipole moment of the folliwng is:

I. CH_3Cl, II. CH_3Br, III. CH_3F

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

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

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

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

Answer: *b*

View Text Solution

160. Bottles containing C_6H_5I and C_6H_5 - CH_2I lost their original lables. They were labelled A and B for festing. A and B were separately taken in a test tube and boiled with $NaOH$ solution. The end solution in each tube was made acidic with dilute HNO_3 and then some $AgNO_3$ solution was added. Substance B gave a yellow precipitate. Which one of the following statements is true for this experiment.

A. Addition of HNO_3 was unnecessary

B. (A) was PhI

C. (A) was $PhCH_2I$

D. (B) was Phl

Answer: ***b***

Watch Video Solution

161. One mole of 1,2-dibromopropane on treatment with X moles of $NaNH_2$ followed by treatment with ethyl bromide gave a pentyne. The value of X is:

A. 1

B. 2

C. 3

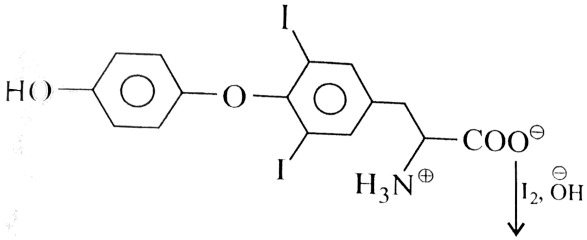
D. 4

Answer: c

Watch Video Solution

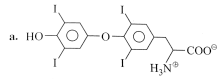
Exercises Single Correct Answer Type

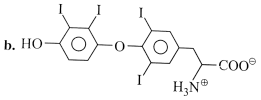
1. In the reaction is:

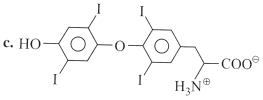


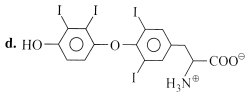
Thyroxine, a thyroid hormone that helps to regulate metabolic rate

Thyoxine is:

A. 

B. 

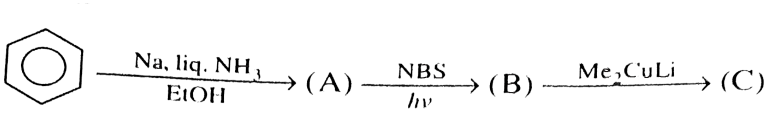
C. 

D. 

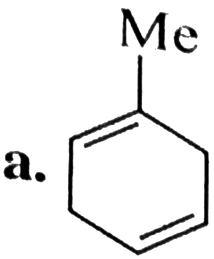
Answer: ***b***

View Text Solution

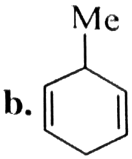
2. The final product (C) in the follwing reactions is:



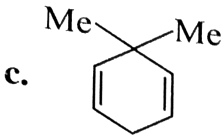
A.



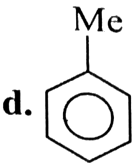
B.



C.

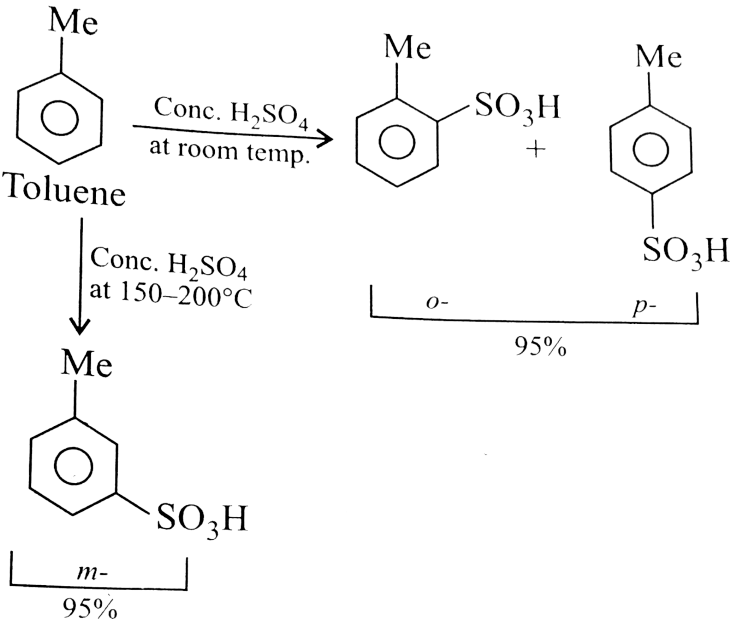


D.



Answer: ***b***

View Text Solution



3.

Which of the following staements is wrong about the reactions?

A. At lower temperature, the reaction is kinetically controlled and o/p directive effects of the (Me) group operate.

B. At a higher temperature, the reaction is thermo-dynamically controlled, adnn longer reaction times are employed for equilibrium to be reached . The most stable from of m - toulene sulphonic acid is obtained.

C. $(Me$ -) group is activated by $+I$ effect, and o - , p - directing.

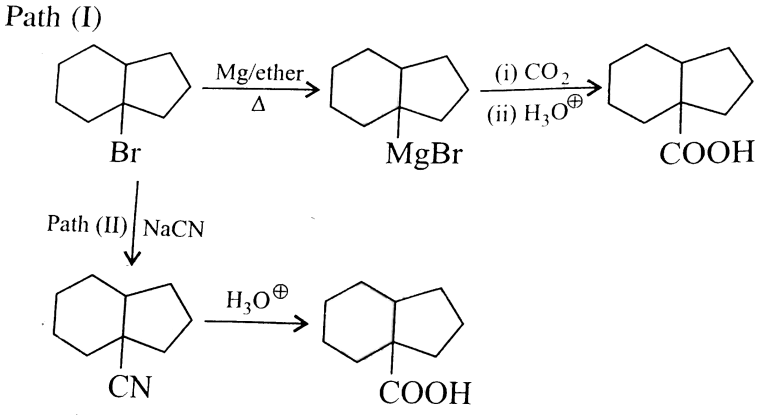
D. $(Me-)$ group is deactivating by hyperconjugation and is m-directing.

Answer: ***d***

View Text Solution

4. In the following reaction, the final product can be prepared by two paths (I) and (II).

Which of the folliwng statemetns is correct?



A. Path (I) si feasible.

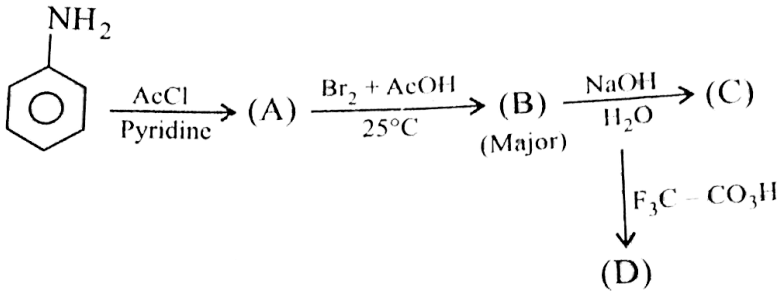
B. Path (II) si feasible.

C. Both paths are feasible.

D. Neither fo the two paths is feasible

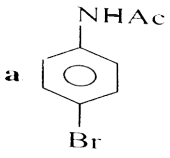
Answer: *a*

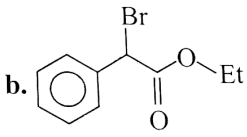
View Text Solution

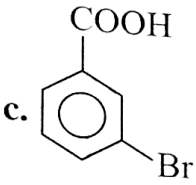


5.

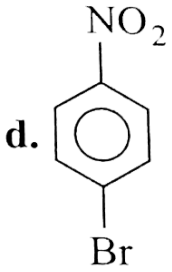
(*D*) would be:

A. 

B. 



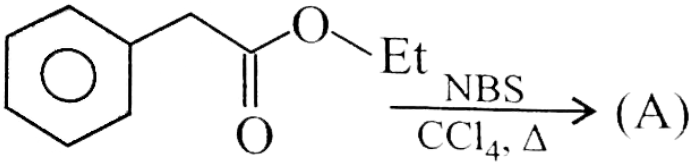
C.



D.

Answer: ***d***

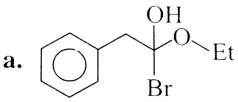
View Text Solution

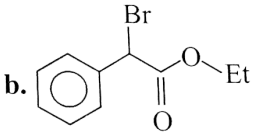


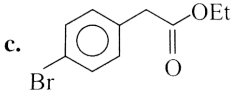
(A) would be:

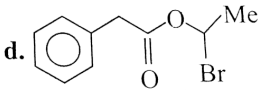
6.

(*A*) would be:

A. a. 

B. b. 

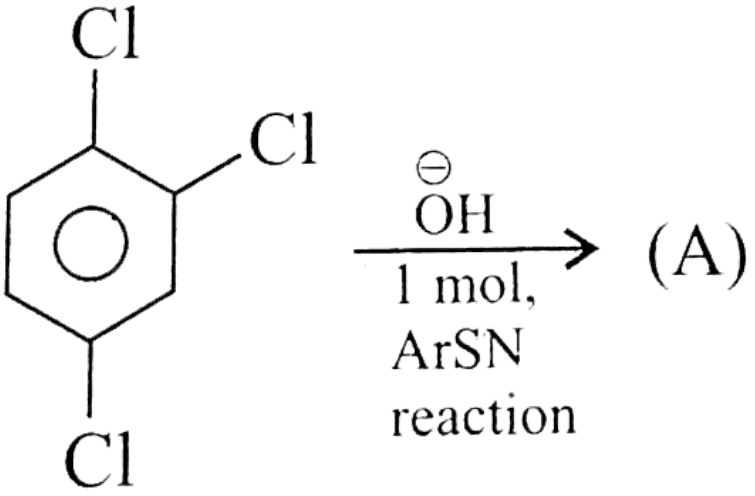
C. c. 

D. d. 

Answer: *b*

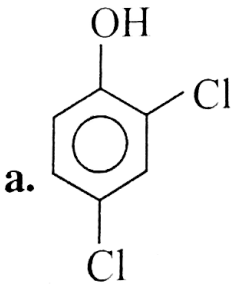
View Text Solution

7.

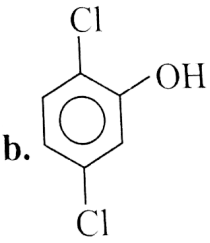


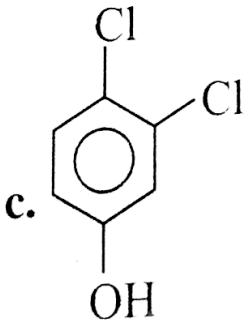
(*A*) would be:

A.

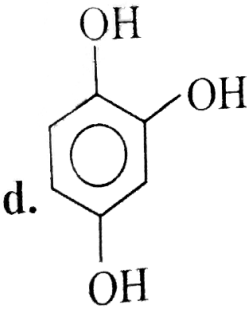


B.



c. 

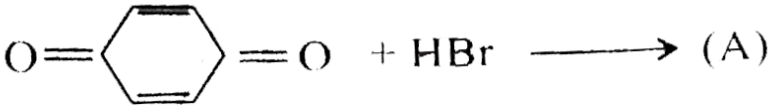
C.

d. 

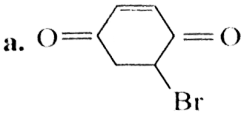
D.

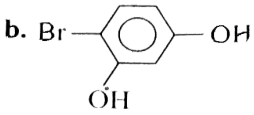
Answer: *a*

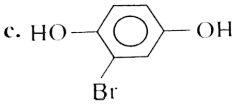
View Text Solution

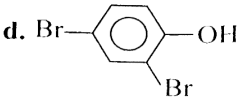
8. 

`(A) would be:

A. 

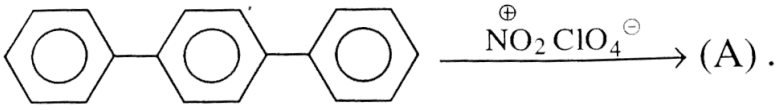
B. 

C. 

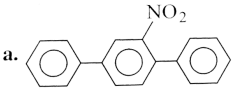
D. 

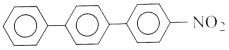
Answer: *c*

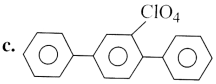
View Text Solution

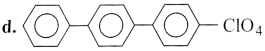
9. 

`(A) would be:

A. a. 

B. b. 

C. c. 

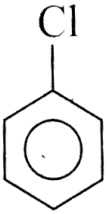
D. d. 

Answer: ***a***

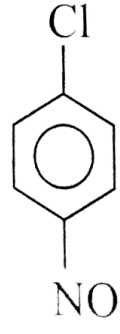
View Text Solution

10. The drecresing order of $ArSN$ reaction with $C_2H_5O^{o-}/ErOH$ is:

I. 

II. 

III. 

IV. 

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

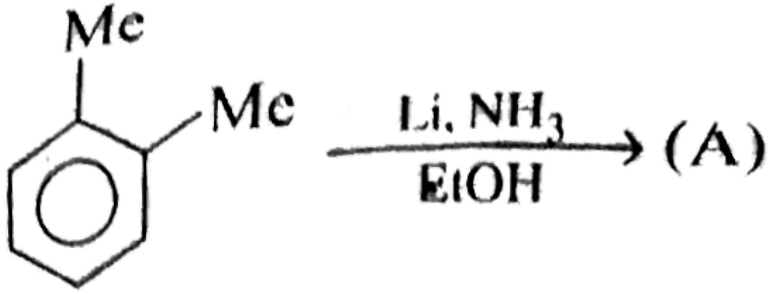
B. $(IV) > (III) > (II) > (I)$

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

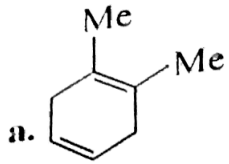
D. $(IV) > (III) > (I) > (II)$

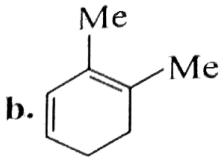
Answer: *c*

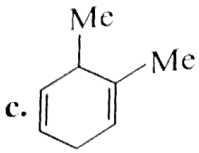
View Text Solution

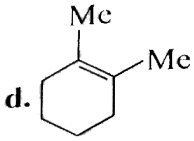
11. 

`(A) would be:

A. 

B. 

C. 

D. 

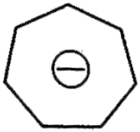
Answer: *a*

View Text Solution

12. Which of the folloiwng is the correct order of stablitly of the given compounds?

I. 

II. 

III. 

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

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

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

D. $(II) > (IIII) > (I)$

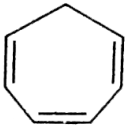
Answer: *a*

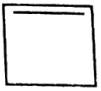
View Text Solution

13. Give the decreasing order of K_a value of the following compounds.

I. 

II. 

III. 

IV. 

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

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

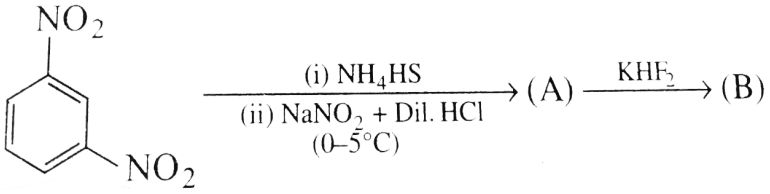
C. $(I) > (III) > (II) > (IV)$

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

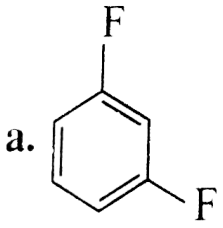
Answer: *a*

View Text Solution

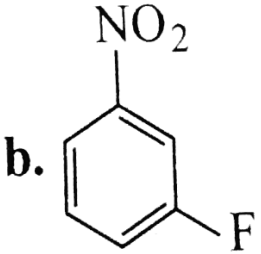
14. What is the end product of the reaction?



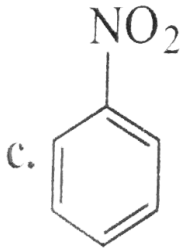
A.

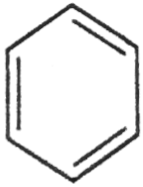


B.



C.



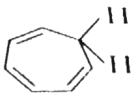
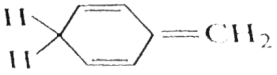
d. 

D.

Answer: *b*

View Text Solution

15. Give the increasing order of pK_a value of the folliwng compounds?

I. C_9H_{10} II.  III. 

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

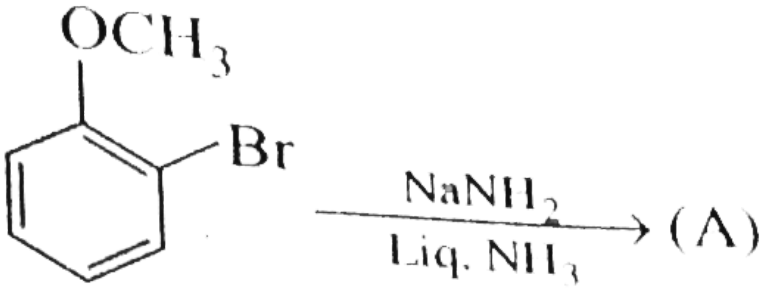
B. $(I) > (II) > (III)$

C. $(II) < (III) < (I)$

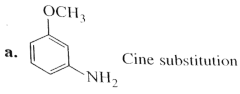
D. (IIII) gt (II) gt (I)`

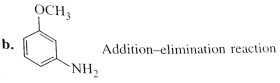
Answer: *a*

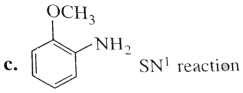
View Text Solution

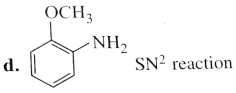
16. 

The major product (A) and reaction (R) are:

A. 

B. 

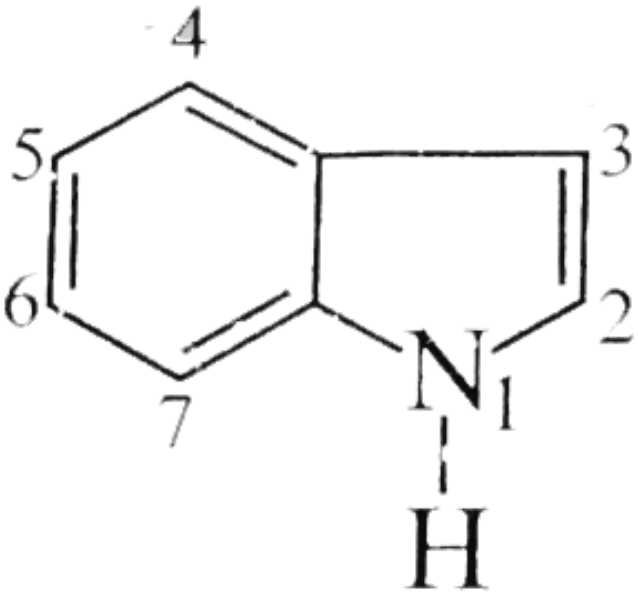
C. 

D. 

Answer: *a*

View Text Solution

17. Which of the following metioned positons in the given compound is more reactive towards electrophilic substituations?



A. 3

B. 2

C. 5

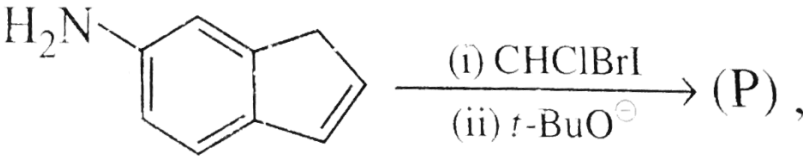
D. 6

Answer: *a*

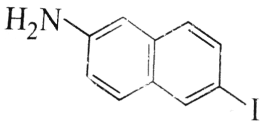
View Text Solution

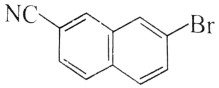
View Text Solution

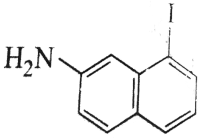
18. In the reaction is

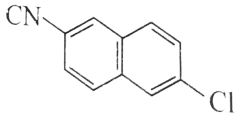


Product (P) wil be:

A. 

B. b. 

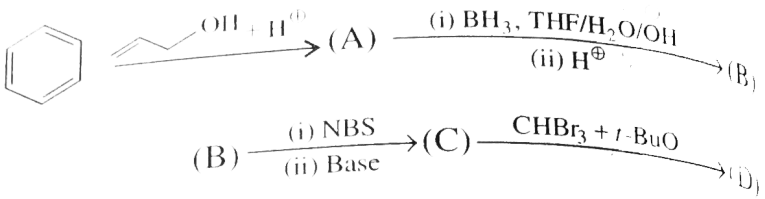
C. c. 

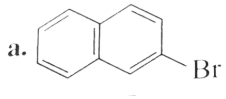
D. d. 

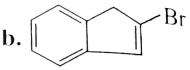
Answer: ***d***

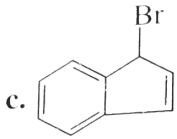
View Text Solution

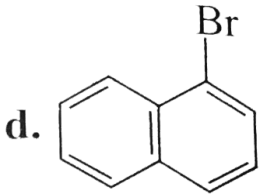
19. What is the end product (D) of the following reaction?



A. 

B. 

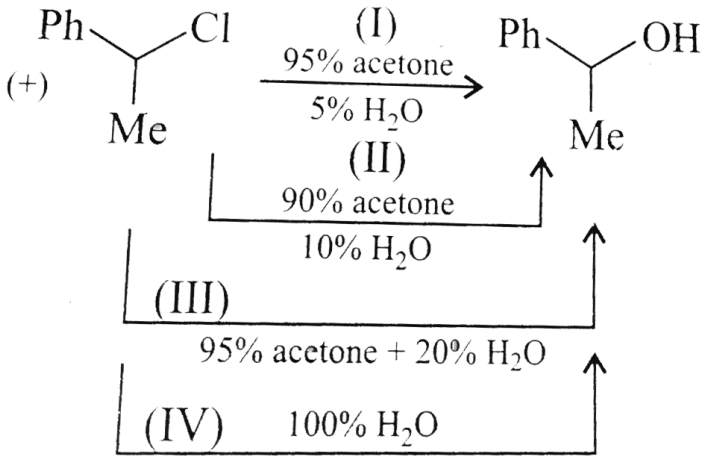
C. 

D. 

Answer: ***a***

View Text Solution

20. Consider the follwing reactions:



Arrange the following reactiosn in the decreasing order of greater proportion of inverted product and select the correct answer.

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

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

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

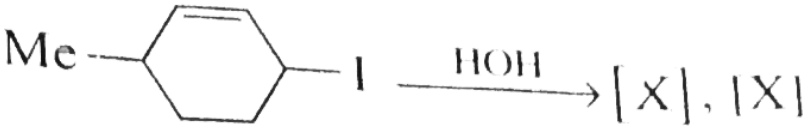
D. $(IV) > (III) > (II) > (I)$

Answer: ***d***

View Text Solution

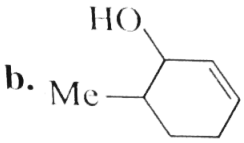
View Text Solution

21. In the reaction

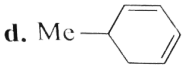


will be:

A. 

B. 

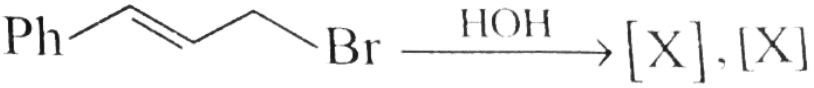
C. Both (a) and (b)

D. 

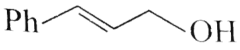
Answer: *a*

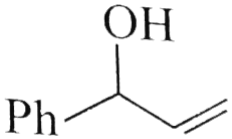
View Text Solution

22. In the reaction

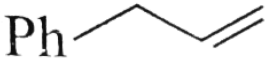


will be:

A. 

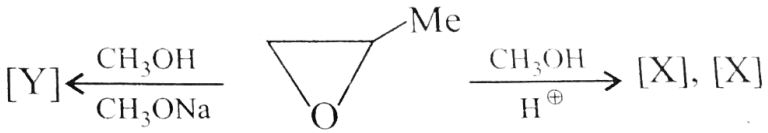
B. 

C. Equimolar mixture of (a) and (b)

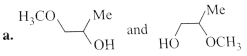
D. 

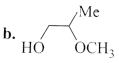
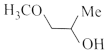
Answer: *c*

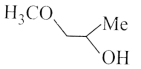
View Text Solution

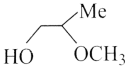
23. 

are:

A. a.  and

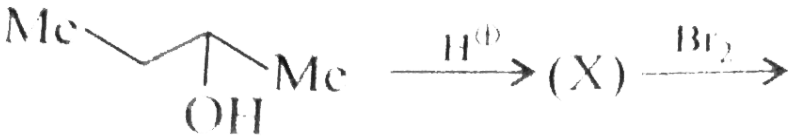
B. b.  and 

C. c.  in both cases

D. d.  in both cases

Answer: *b*

View Text Solution

24.  five compounds with formula $C_4H_8Br_2$. How many structures of (X) are possible?

A. 2

B. 3

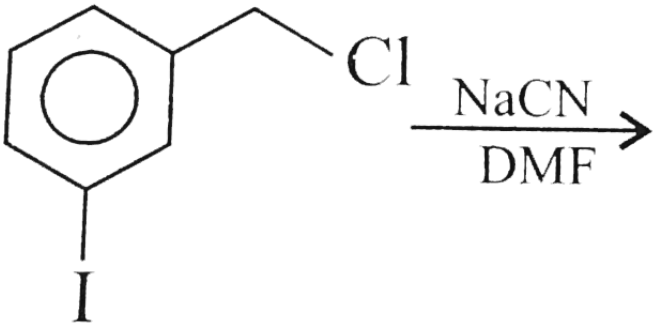
C. 4

D. 5

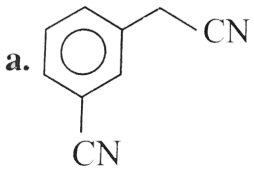
Answer: ***b***

View Text Solution

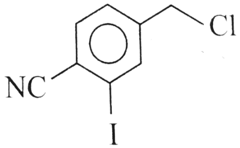
25. The sturcture of the major product formed in the following reaction is:



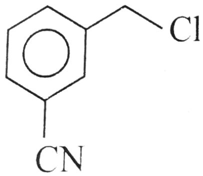
A.



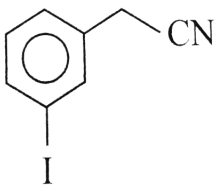
B. b.



C. c.



D. d.



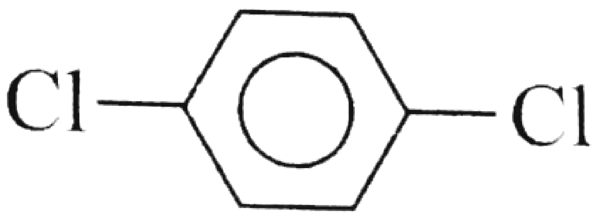
Answer: *d*

View Text Solution

26. Consider the follwing halogen containing compounsds:

I. $CHCl_3$, II. $\mathbb{C}l_4$, III. CH_2Cl_2

IV. CH_3Cl , V.

V. 

A. $(II) < (V)$

B. (II)

C. $(III) < (IV)$

D. $(I), (IV)$

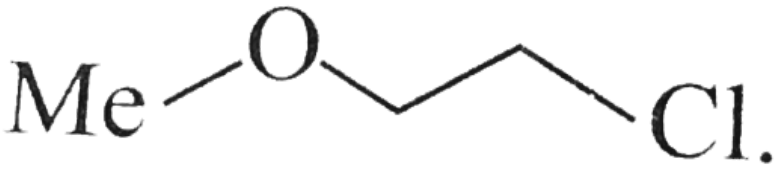
Answer: a

View Text Solution

Exercises Assertion-Resoning Type

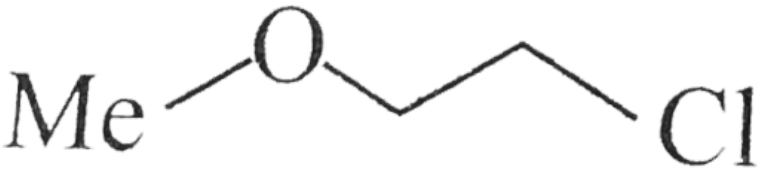
1. Assertion (A):

reacts faster with H_2O than



Reason `(R): The carbocation of

is more than the carbocation of



A. Both (A) and (R) are true and $(R0$ is the correct explanation of (A).

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

C. $(A)istruebut$(R)` is false.

D. $(A)isfalsebut$(R)` is true.

Answer: *d*

View Text Solution

Exercises Assertion-Resoning

1. Assertion (A): SN^1 reaction is carried out in the presence of a plar protic solvent.

Reason `(R): A polar protic solvent increases the stability of carbocation due to solvation.

A. Both (A) and (R) are true and $(R0$ is the correct explanation of (A).

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

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

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

Answer: d

Watch Video Solution

2. Assertion (A): SN^(2) $reactioniscarriedout \in thepresenceofpolaraproticsolvent.$ $Reason$(R): Polar aprotic solvents do not contain acidic hydrogen.

A. Both (A) and (R) are true and $(R0$ is the correct explanation of (A).

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

C. $(A)istruebut$(R)` is false.

D. $(A)isfalsebut$(R)` is true.

Answer: *b*

View Text Solution

3. Assertion (A): Reaction between $\left(Me_3CONa\right)$ (sodium ter-butoxide) and ethyliode $\left(C_2H_5I\right)$ does not produce an ether.

Reason `(R): Sodium ter-butoxide is a very strong base but is not a nucleophile.

A. Both (A) and (R) are true and $(R0$ is the correct explanation of (A).

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

C. $(A)istruebut$(R)` is false.

D. $(A)isfalsebut$(R)` is true.

Answer: a

View Text Solution

4. Assertion (A): $tert$ - Butyl bromide $\left(Me_3C - Br\right)$ and sodium ethoxide $(NaORt)$ will react to form only ether.

Reason `(R): Ethers are preapared form soidum alkoxide and alkyl halide.

A. Both (A) and (R) are true and $(R0$ is the correct explanation of (A).

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

C. $(A) is true but (R)$` is false.

D. $(A) is false but (R)$` is true.

Answer: *b*

View Text Solution

5. Assertion: Benzyl bromide when kept in acetone water produces benzyl alcohol.

Reason: The reaction follows S_N2 mechanism.

A. Both (A) and (R) are true and $(R0$ is the correct explanation of (A).

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

C. $(A) is true but (R)$` is false.

D. $(A) is false but (R)$` is true.

Answer: *b*

Watch Video Solution

6. Assertion: Hydroxyketones are not directly used in Grignard reaction.

Reason : Griganard reagnts react with hydroxyl group.

A. Both (A) and (R) are true and $(R0$ is the correct explanation of (A).

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

C. $(A)istruebut$(R)` is false.

D. $(A)isfalsebut$(R)` is true.

Answer: a

Watch Video Solution

7. Assertion (A): 2 - Bromobutane on reaction with sodium ethoxid eihoxide in ethanol gives 1 - butene as a major product.

Reason (R): i-$Bute \neq ism$ or $estab \leq than$2-` butene.

A. Both (A) and (R) are true and $(R0$ is the correct explanation of (A).

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

C. $(A)istruebut$(R)` is false.

D. Both (A) and (R) are false.

Answer: d

View Text Solution

8. Assertion (A): The presence of nitro group facitates nucleophilic substiution reaction in aryl halide.

Reason `(R): The intermdiate carbonion is stablised due to the presence of the nitro group.

A. Both (A) and (R) are true and $(R0$ is the correct explanation of (A).

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

C. $(A)istruebut(R)`$ is false.

D. $(A)isfalsebut(R)`$ is true.

Answer: a

View Text Solution

9. Assertion (A): $MeMgBr$ should be preapared under perfectly anhydrous conditions.

Reason `(R): Grinard reagent reacts with water.

A. Both (A) and (R) are true and $(R0$ is the correct explanation of (A).

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

C. $(A)istruebut(R)`$ is false.

D. $(A)isfalsebut(R)`$ is true.

Answer: a

View Text Solution

10. Assertion (A): IN comparison to C_2H_5Br, it is difficult to carry out SN reaction o vinyl bromide.

Reason `(R): Vinyl group is electron donating.

A. Both (A) and (R) are true and $(R0$ is the correct explanation of (A).

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

C. $(A)istruebut$(R)` is false.

D. $(A)isfalsebut$(R)` is true.

Answer: c

View Text Solution

11. Assertion (A): $PhBr$ is less reactive than C_2H_5Br towards SN reactions.

Reason (R): $Thef$ or $cesofarafctionbetween$RX and H_(2)O

$mo \leq ce\underline{s}areweakerthanthosepresentbetweenthemo \leq ce\underline{s}of$RX` and water molelcules separate,u.

A. Both (A) and (R) are true and $(R0$ is the correct explanation of (A).

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

C. $(A)istruebut$(R)` is false.

D. $(A)isfalsebut$(R)` is true.

Answer: ***b***

View Text Solution

12. Assertion : Reaction of tert - butychloride with Na gives $2, 2, 3, 3$ - tetramethyl butane.

Reason : Tert - butyl chloride on Wurtz reaction give alkene.

A. Both (A) and (R) are true and $(R0$ is the correct explanation of (A).

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

C. $(A) is true but (R)$` is false.

D. Both (A) and (R) are false.

Answer: d

Watch Video Solution

Archives Single Correct

1. Among the following compounds the one that is most reactive towards electrophilic nitration is

A. Tooluene

B. Benzene

C. Benzoic acid

D. Nitrobenzene

Answer: a

Watch Video Solution

2. The reaction of toluene with chlorine in the presence of ferric chloride gives mainly

A. Benzoyl chloride

B. m - Chlorotoluene

C. Benzyl chloride

D. o - and p - Chlorotoluene

Answer: d

Watch Video Solution

3. In the reaction of p-chlorotoluene with KNH_2 is liguid NH_3 the major product is .

A. o - Toluidine

B. m - Toluidine

C. p - Toluidine

D. p - Chloronailine

Answer: b

Watch Video Solution

4. Benzylchloride $\left(C_6H_5CH_2Cl\right)$ can be prepared from toluene by chlorination with :

A. SO_2Cl_2

B. $SOCl_2$

C. Cl_2

D. $NaOCl$

Answer: c

Watch Video Solution

5. A solution of (+)-2-chloro-2-phenyl ethane in toluene racemises slowly in the presence of small amount of $SbCl_5$, due to the formation of:

A. Carbanion

B. Carbene

C. Free radical

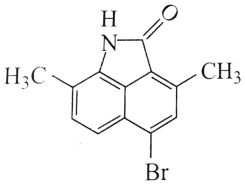
D. Carbocation

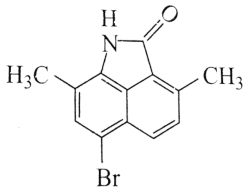
Answer: d

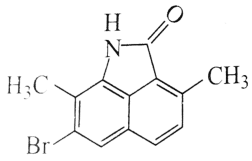
Watch Video Solution

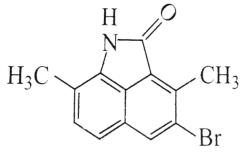
6. 

product on monobromination of this compound is

A. 

B. 

C. 

d. D. 

Answer: *b*

Watch Video Solution

7. Which of the following is soluble in water?

A. CS_2

B. C_2H_5OH

C. CCl_4

D. $CHCl_3$

Answer: ***b***

Watch Video Solution

8. When phenol is treated with excess of bromine water, it gives

A. m - Bromophenol

B. o - and p - bromophenol

C. 2, 4 - Dibromophenol

D. 2, 4, 6 - Tribromophenol

Answer: ***d***

Watch Video Solution

9. Chlorobenzene can be prepared by reacting aniline with

A. Hydrochloric acid

B. Cuprous chloride

C. Chlorine in the presence of anhydrous aluminium chloride

D. Nitrous acid followed by heating with curprous chloride

Answer: ***d***

Watch Video Solution

10. The reaction conditions leading to the best yield of C_2H_5Cl are

A. $C_2H_6(\text{Excess}) + Cl_2 \xrightarrow{U.V.\text{ light}}$

B. $C_2H_6 + Cl_2(\text{Excess}) \xrightarrow[\text{room temp.}]{\text{Dark}}$

C. $C_2H_6 + Cl_2(\text{Excess}) \xrightarrow{U.V.\text{ light}}$

D. $C_2H_6 + Cl_2 \xrightarrow{U.V.\text{light}}$

Answer: ***a***

Watch Video Solution

11. n-Propyl bromide on treatment with ethanolic potassium hydroxide produes .

A. Propane

B. Propene

C. Porpyne

D. Propanol

Answer: ***b***

Watch Video Solution

12. Phenol reacts with bromine in carbon disulphide at low temperature to give

A. m - Bromophenol

B. o - and p - bromophenol

C. p - Bromophenol

D. $2, 4, 6$ - Tribromophenol

Answer: b

Watch Video Solution

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

A. o - Cresik

B. p - Cresol

C. `2,4- Dihydroxy toulene

D. Benzoic acid

Answer: d

Watch Video Solution

14. 1 - Chlorobutane on reaction with alchloic potash gives:

A. 1 - Butene

B. 1 - Butanol

C. 2 - Butene

D. 2 - Butanol

Answer: a

Watch Video Solution

15. Among the following compounds , the strongest acid is:

A. $HC = CH$

B. C_6

C. C_2H_6

D. CH_3OH

Answer: *d*

Watch Video Solution

16. The order of reactivities of the following alky halides for an S_N2 reaction is .

A. $RF > RCl > RBr > RI$

B. $RF > RBr > RCI > RI$

C. $RCl > RBr > RF > RI$

D. $RI > RBr > RCI > RF$

Answer: *d*

Watch Video Solution

17. The compound that will react most readily with $NaOH$ to from methanol is

A. $\left(CH_3\right)_4\overset{\oplus}{N}I^{\theta}$

B. CH_3OCH_3

C. $\left(CH_3\right)_3S^{\oplus}I^{\theta}$

D. $\left(CH_3\right)_3Cl$

Answer: ***a***

Watch Video Solution

18. Indentigy the set of reagents/reacatns conditins (X) and (Y) in the following set of transforamtion:

$$CH_3\text{-}CH_2\text{-}CH_2Br \xrightarrow{(Br)} \text{Product} \downarrow (Y)\, CH_3\text{-}CH(Br)\text{-}CH_3$$

A. (X) = Dilute aqueosu $NaOH$, $20^\circ C$

$(Y) = HBr/$acetic acid, $20^\circ C$

B. (X) = Concentrated alcholic $NaOH$, $80^\circ C$

$(Y) = HBr/$acetic acid, $20^\circ C$

C. (X) =Dilue aqueous $NaOH$, $20^\circ C$

$(Y) = Br_2/CHCl_3, 0c$

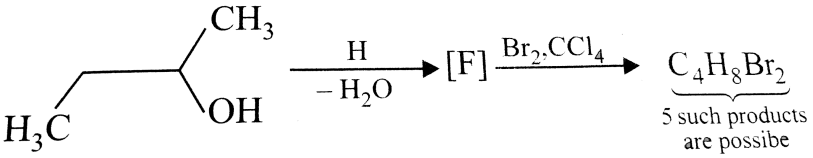
D. (X) = Concentrateed alcoholic $NaOH$, $80^\circ C$

$(Y) = Br_2/CHCl_3, 0c$

Answer: ***b***

View Text Solution

19. How many structures for F are possible



A. 2

B. 5

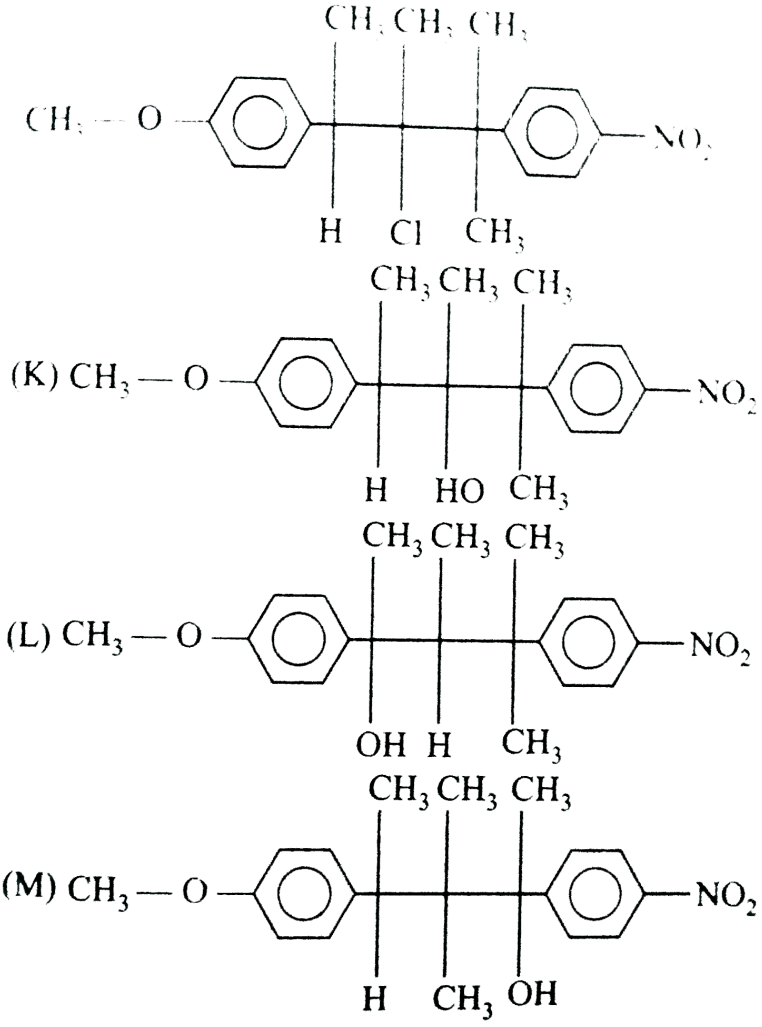
C. 6

D. 3

Answer: d

Watch Video Solution

20. The following compound on hydrolysis in equeous acetone will give .



A. Mixture of (K) and (L)

B. Mixture of (K) and (M)

C. Only (M)

D. Only (K)

Answer: a

Watch Video Solution

21. $CH_3NH_2 + CHCl_3 + KOH \rightarrow$ nitrogen containing compound $+KCl + H_2O$. Nitrogen containing compound is

A. $CH_3 - C \equiv N$

B. $CH_3 - NH - CH_3$

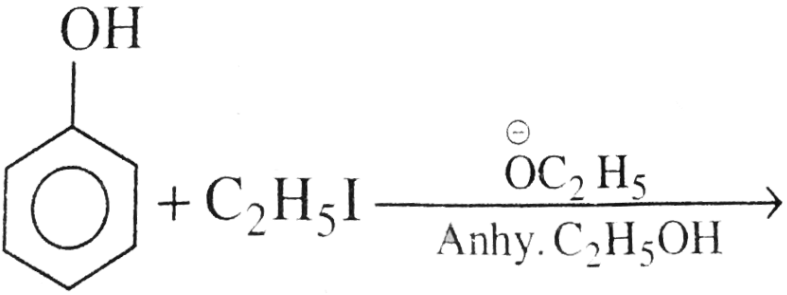
C. $CH_3 - \overset{\theta}{N} \equiv \overset{\oplus}{C}$

D. $CH_3\overset{\oplus}{N} \equiv \overset{\theta}{C}$

Answer: d

Watch Video Solution

Archives Single Correct Answer Type



1.

A. $C_6H_5OC_2H_5$

B. $C_2H_5OC_2H_5$

C. $C_2H_5OC_6H_5$

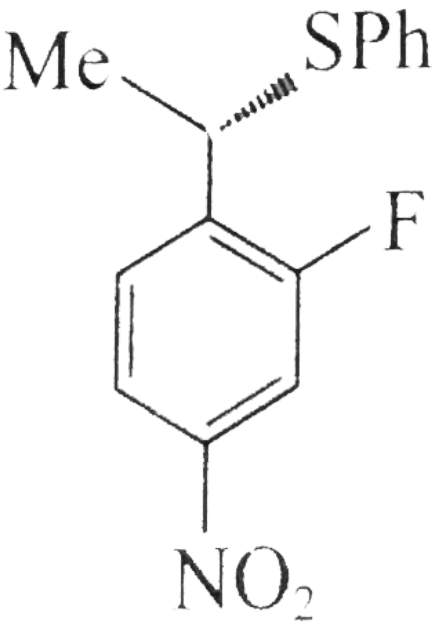
D. C_2H_5I

Answer: ***b***

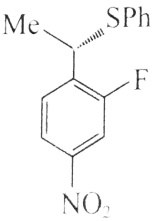
View Text Solution

2. The major product of the following reaction is"

a.

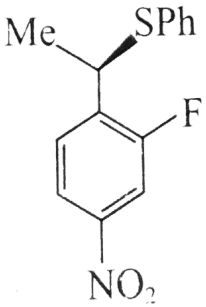


a.

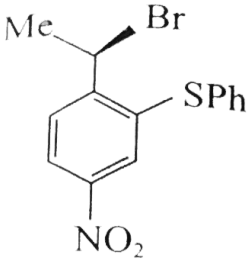


A.

b.

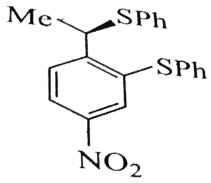


B.



C.

d.

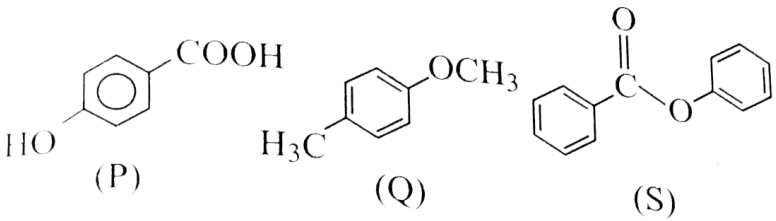


D.

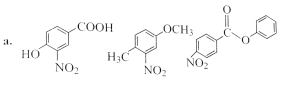
Answer: *a*

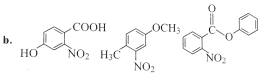
View Text Solution

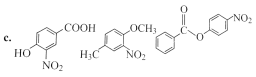
3. Compounds (P), (Q) and (S)

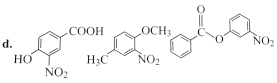


were separetly subjected to nitration using HNO_3/H_2SO_4 mixture. The major product formed in each case, respectively is:

A. 

B. 

C. 

D. 

Answer: c

View Text Solution

Archives Mutiple Correct

1. An aromatic molecule will

A. Have $4n\pi$ - electrons

B. Have $(4n + 2)\pi$ - electrons

C. Be planar

D. Be cyclic

Answer: (*b*, *c*, *d*)

Watch Video Solution

2. Toluene, when treated with Br_2/Fe gives p-bromotoluene as the major product, because the CH_3 group:

A. is para-directing

B. is meta-directing

C. avtivates the ring by hyperconjugation

D. deativates the ring

Answer: (a, c)

Watch Video Solution

3. Aryl halides are less reactive towards nucleophilic substitution reaction as compared to alyl halides due to

A. The formation of less stable carbonium iion

B. Resonance stablisation

C. Longer carbon halogen bond

D. sp^2 - Hybrisised carbon attached to the halogen.

Answer: (b, d)

Watch Video Solution

4. The compounds used as refrant are:

A. NH_3

B. CCl_4

C. CF_4

D. CF_2Cl_2

Answer: (*a*, *d*)

View Text Solution

5. The products of reaction of alcoholic silver nitrate with ethyl bromide are

A. Ethane

B. Ethene

C. Nitroethane

D. Ethyl nitrite

Answer: (c,d)`

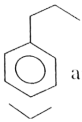
Watch Video Solution

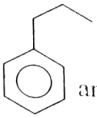
Archives Mutiple Correct Answers Type

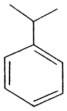
1.  $+ ClCH_2CH_2CH_3 \xrightarrow{AlCl_3}$

$$(P) \xrightarrow[(ii)\ H_3O^+]{(i)\ O_2\ /\ \Delta} (Q) + \text{Phenol}$$

The majore products (P) and (Q) are:

A.  and CH_3CH_2CHO b.

B.  and CH_3COCH_3

C.  and CH_3COCH_3

D. d.  and CH_3CH_2CHO

Answer: *c*

View Text Solution

Archives Fill In Theblanks

1. The structure of the intermediate prouduct formed by the oxidation of toluene with CrO_3 and acetic anhydride ,whose hydrolysis gives benzaldehyde is.....

Watch Video Solution

2. The halogen which is most reactions , in the halogenation of alkanes under sunlight is .....

Watch Video Solution

3. The starting material for the manufacture of polyvinyl chloride is obtained by reacting HCl with .....

Watch Video Solution

4. Formation of phenol from chlorobenzene is an example of

.... Aromatic substitution.

Watch Video Solution

5. In benzene, carbon uses all the three p-orbitals for hybridisation .

Watch Video Solution

6. True or False?

An electron donating substituent in benzene orients the incoming electrophilic group to the meta-position.

Watch Video Solution

7. Carbon tetrachloride burns in air when lighted to give phosgene .

Watch Video Solution

Watch Video Solution

8. The yield of ketone when a secondary alcohol is oxidised is more than the yeild of aldehyde when a primary alcohol is oxidised.

Watch Video Solution

9. Carbon tetrachloride is inflammable.

Watch Video Solution

10. Sodium ethoxide is prepared by reacting ethanol with aqueous sodium hydroxide.

Watch Video Solution

11. The reaction of vinyl chloride with hydrogen iodide to give 1-chloro-1-iodoethane is an example of anti-Markownikoff's rule.

Watch Video Solution

12. Photobromination of 2-methylpropane gives a mixture of 1-bromo-2-methyl propane in the ratio $9:1$.

Watch Video Solution

Archives Assertion-Resoning

1. Assertion: Aryl halides undergo nucleophilic substitution reactions with ease.

Reason: The carbon halogen bond in aryl halides has partial double bonds character.

A. Statement 1: is true Statement 2: is true, Statement 2 is the correct explainion of Statement 1

B. Statement 1 is true, Statement 2 is true, Statement 2 is not the correct explainion fo Statement 1.

C. Statement 1 is true, Statement 2 is false.

D. Statement 1 is false, Statement 2 is true.

Answer: D

Watch Video Solution

2. Statement I Benzonitrile is prepared by the reaction of chlorobenzene with potassium cyanide.

Statement II Cyanide $\left(CN^{-}\right)$ is a strong nucleoohile.

A. Statement 1: is true Statement 2: is true, Statement 2 is the correct explainion of Statement 1

B. Statement 1 is true, Statement 2 is true, Statement 2 is not the correct explainion fo Statement 1.

C. Statement 1 is true, Statement 2 is false.

D. Statement 1 is false, Statement 2 is true.

Watch Video Solution

3. Assertion: Bromobenzene upon reaction with Br_2/Fe gives 1,4-dibromobenzene as the major product

Reason In bromobenzene the inductive effect of the bromo group is more dominant than the mesomeric effect in directing the incoming electrophile .

A. Statement 1: is true Statement 2: is true, Statement 2 is the correct explainion of Statement 1

B. Statement 1 is true, Statement 2 is true, Statement 2 is not the correct explainion fo Statement 1.

C. Statement 1 is true, Statement 2 is false.

D. Statement 1 is false, Statement 2 is true.

Answer: C

Watch Video Solution

Archives Subjective

1. Give reason for the following in one or two sentences:

'Although benzene in highly unsaturated, normally it does not undergo addition reaction'.

Watch Video Solution

2. Show with balanced equation what happens when the 'p-xylene is reacted with concentrated sulphuric acid and the resultant product is fused with KOH'.

Watch Video Solution

3. How many sigma and pi bonds are present in a benzene molecule?

Watch Video Solution

4. Write down the main product of the following reaction

$$\text{Benzene} \xrightarrow{CH_3CH_2COCl/AlCl_3}$$

Watch Video Solution

5. Answer the following with suitable equation wherever necessary

(i) How can you prepare benzene from lime?

(ii) How will you convert toluene to m-nitrobenzonic acid?

Watch Video Solution

6. Arrange the following in increasing order of reactivity towards sulphonation with fuming sulphuric acid.

Benzene, toluene, methoxy benzene, chlorobenzene.

Watch Video Solution

7. Give reasons in two or three sentences only for the following: Phenul group is known to exert negative inductive effect, but each phenyl ring in biphenyl $\left(C_6H_5\text{-}C_6H_5\right)$ is more reactive than benzene towards electrophilic substitution.

Watch Video Solution

8. Product the major product in the following reactions:

i. $C_6H_6 + \left(CH_3\right)_2CHCH_2OH \xrightarrow[(i)\,Br_2\text{heat light}]{H_2SO_4} \ldots$

ii. $C_6H_5C_2H_5 \xrightarrow[(ii)\,NaCN]{} \ldots.$

View Text Solution

9. Predict the structure of the intermediates/products in the following reaction sequences

Watch Video Solution

10. Toluene reacts with bromine in the presence of the light to give benzyl bromide, while in presence of $FeBr_3$ it gives p-bromotoluene. Give explanation for the above observation.

Watch Video Solution

11. Give reasons for the following in one or two sentences "Nitrobenzene does not undergo Friedel-Craft's alkylation."

Watch Video Solution

12. Give reasons for the following:

(i) tert-buty lbenzene does not give benzonic acid on treatment with acidic $KMnO_4$.

(ii)Normally, benzene gives electrophilic substitution reaction rather than electrophilic addition reaction although it has double bond.

Watch Video Solution

13. 7-bromo-1,3,5-cycloheptatriene exists as ionic species in aqueous solution while 5-bromo-1,3-cyclopentadiene doesn't ionise even in presence of $Ag^+(aq)$, Explain.

Watch Video Solution

14. An organic liquid 'A' containing C,H and O with boiling point $78^\circ C$, possessing a rather pleasant odous. On heating with concentrated sulphuric acid gives a gaseous product 'B' with the empirical formula CH_2 'B' decolourises bromine water as well as alkaline permanganate solution

and takes up one mole of H_2 (per mole of B) in presence of finely divided nickel at high temperature. Identify the substances A and B.

Watch Video Solution

15. show by chemical equactions only how would you prepare the following from the indicated starting materials. Specify the reagents in each step of synthesis of:

i. Chloroform from carbon disulphide.

ii. Hexachlorothane $\left(C_2Cl_6\right)$ from calcium carbide.

View Text Solution

16. Chloroform is stored in dark colured bottles. Explain in not more than two sentences.

View Text Solution

17. A compound (X) containg C, H, and O is unreactive towards sodium. It does not add with bromine. It also and excess of $Hl, (X)$ yields only one organic product (Y), (Y) on hydrolsis yield s a new compond (Z) whch can be converted to (Y) by reaction with red phosphours and permangnate gives a carboxlic acid. The equivalanet weight of this acid is 60. What are the compounds (X), teh conversion of (X) to (Y).

View Text Solution

18. State the conditions under which the following preaprations are carried out. Giver the necessary eqactions which need not be balanced.

i. Ethabnol form accetllene.

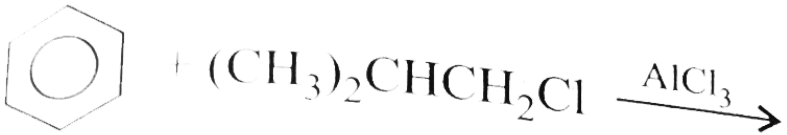
ii. Lead tetracthyl from sodium lead alloy.

iii. Methyl chloride from aluminium carbide.

View Text Solution

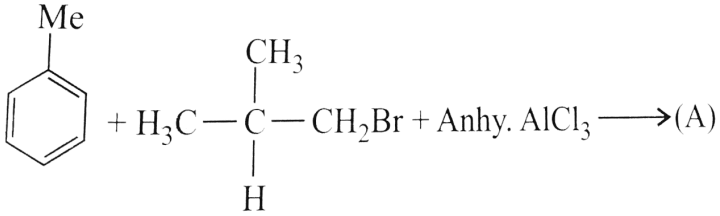
Archives Subjective Type

1. Write the structure of the major organic product expected form the following reaction:



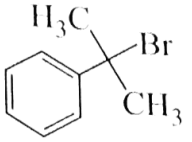
View Text Solution

2. Complete the following giving sturctures of the principle organic products.

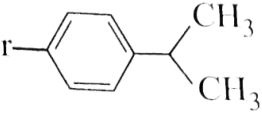


View Text Solution

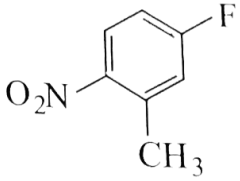
3. Give reasons for the following:

a. i. 

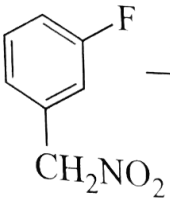
$\xrightarrow{C_2H_5OH\ (aq.)}$ Acidic solution

ii. 

$\xrightarrow{C_2H_5OH\ (aq.)}$ Neutral

b. i. 

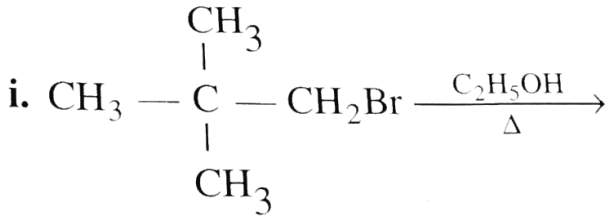
$\xrightarrow{NaOH\ (aq.)}$ $F^{\ominus}$ (Liberated)

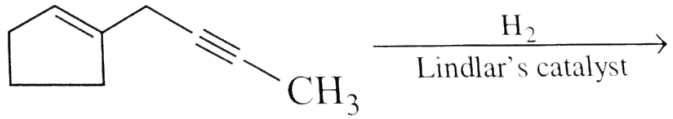
ii. 

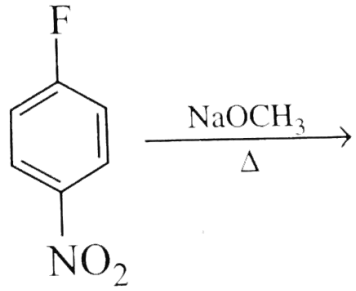
$\xrightarrow{NaOH}$ $F^{\ominus}$ is not liberated.

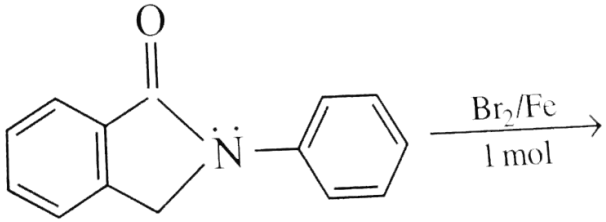
View Text Solution

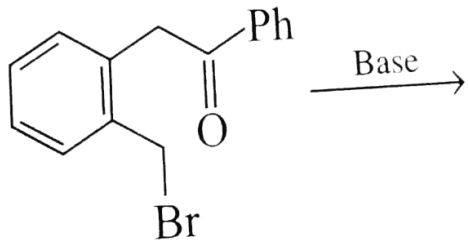
4. What woule be the major product in each of the following reactions?

i. 

ii. 

iii. 

iv. 

v. 

View Text Solution