CHEMISTRY

BOOKS - CENGAGE CHEMISTRY (ENGLISH)

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)-`

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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. $C_6H_5==CHCH_2-$

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3. Write the sturctures of the following compounds:

a. Adjacent tribromobenzene

b. Unsymmetrical trimethyl benzene

c. Symmetrical triethyl benzene

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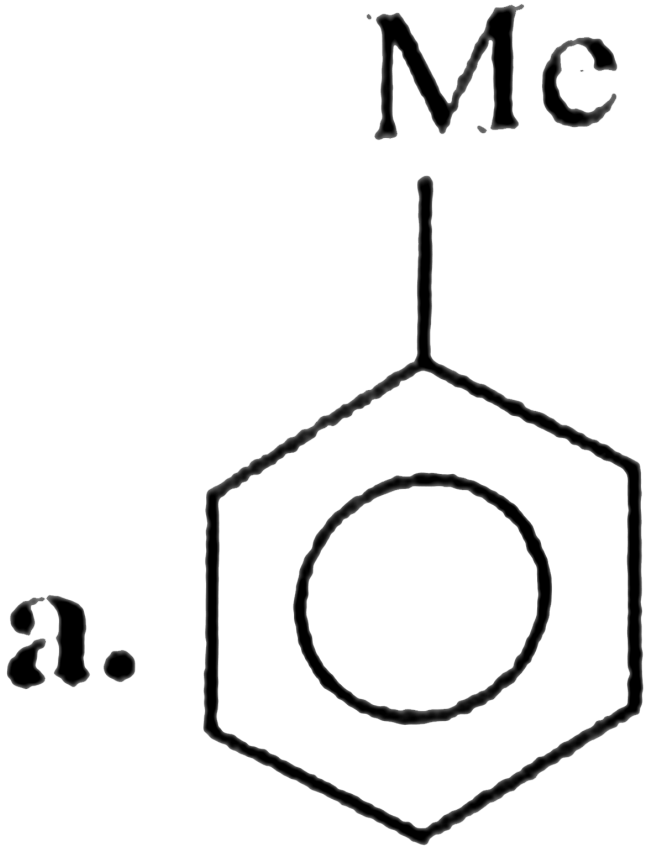
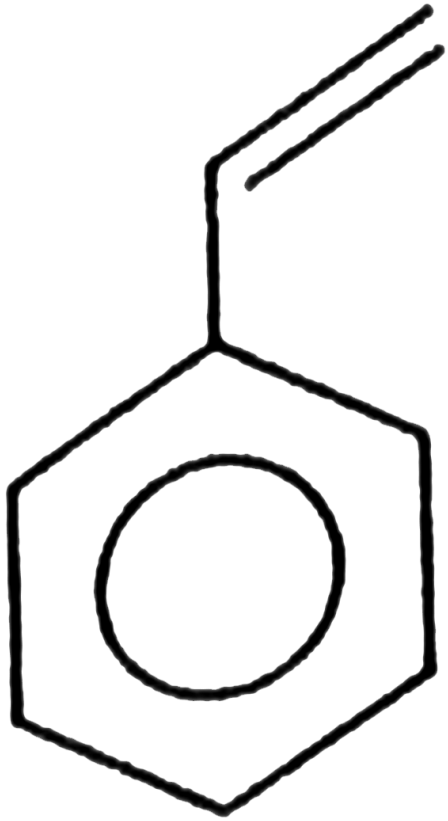
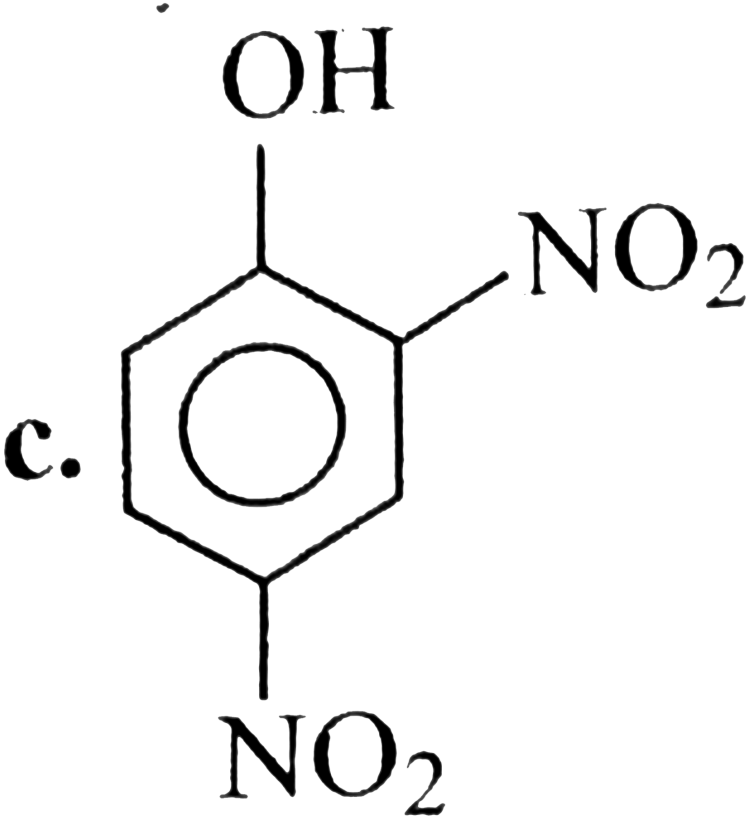
4. Name of the following compounds:



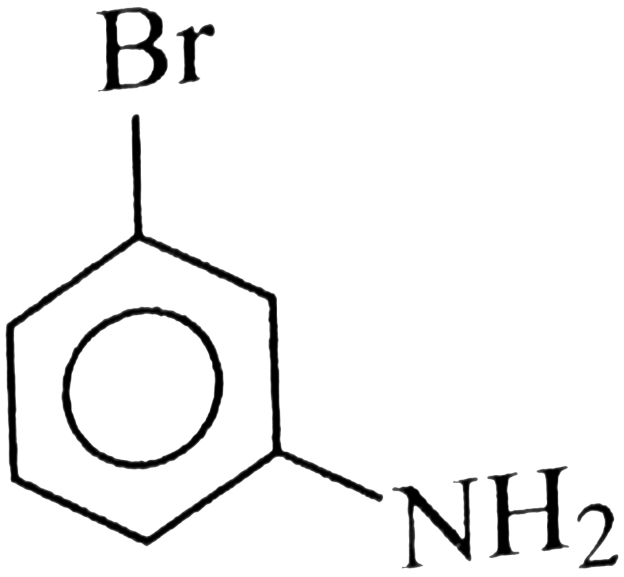
a. , b.

b. 

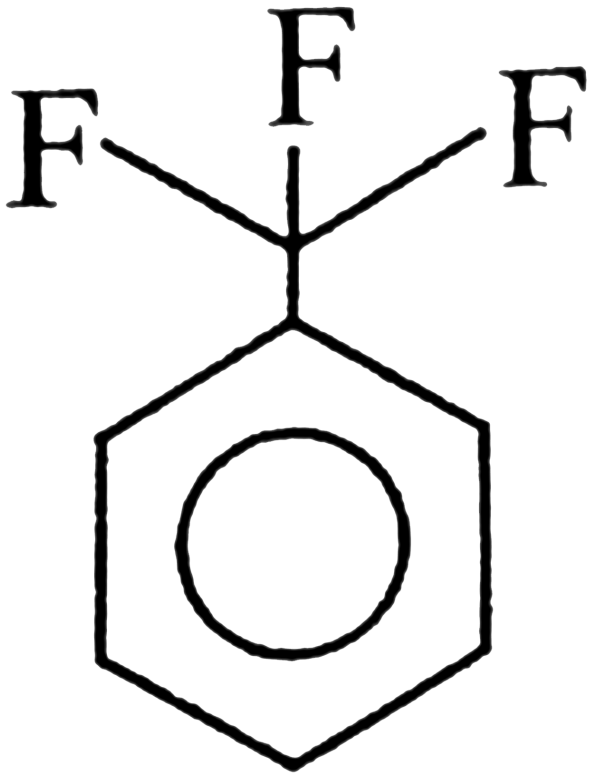
c. 

c. , d.

d.

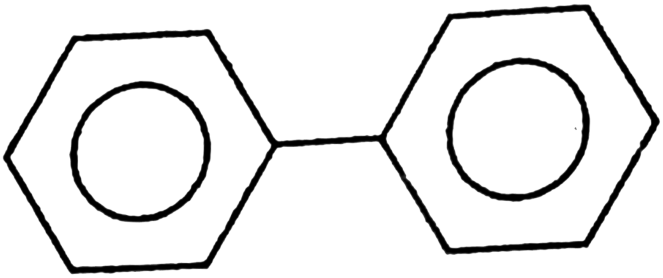


e.

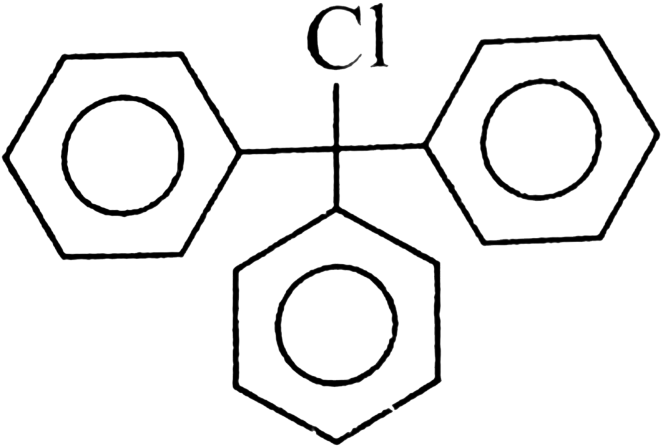


e. , f.

f.

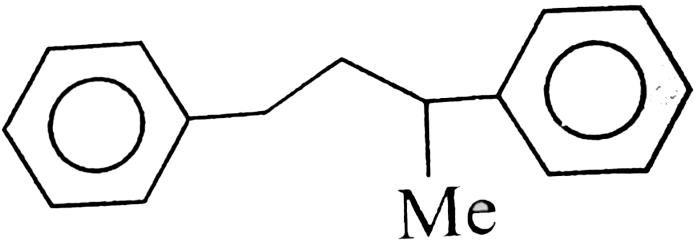


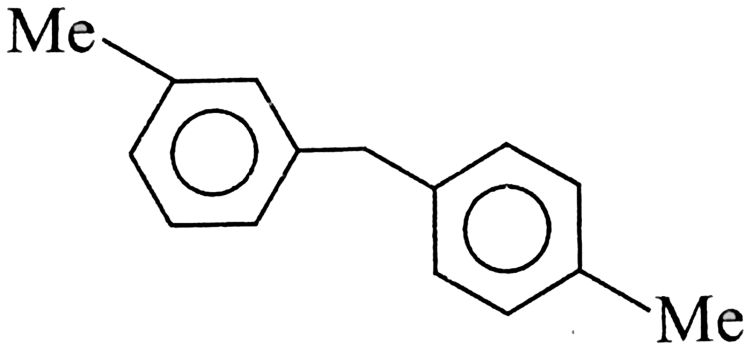
g.



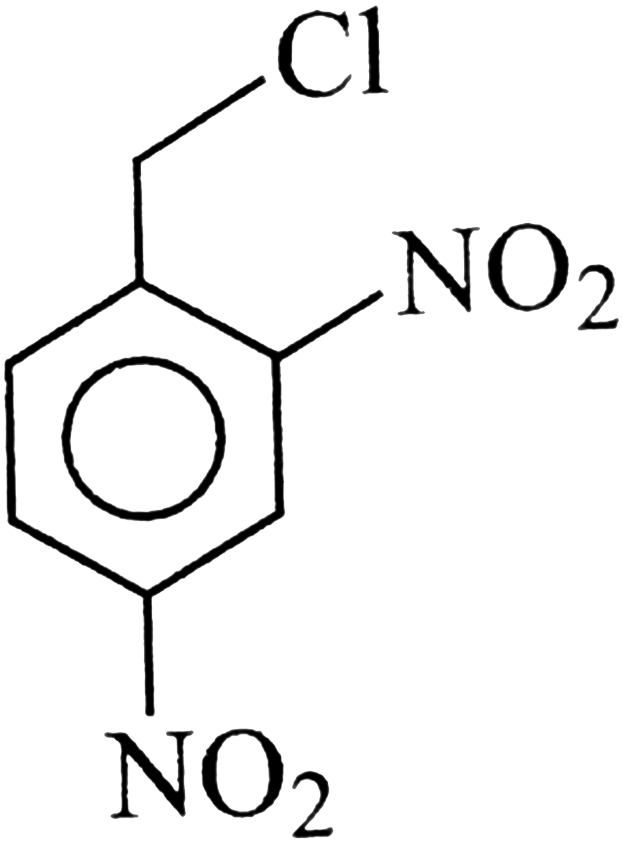
g. , h.

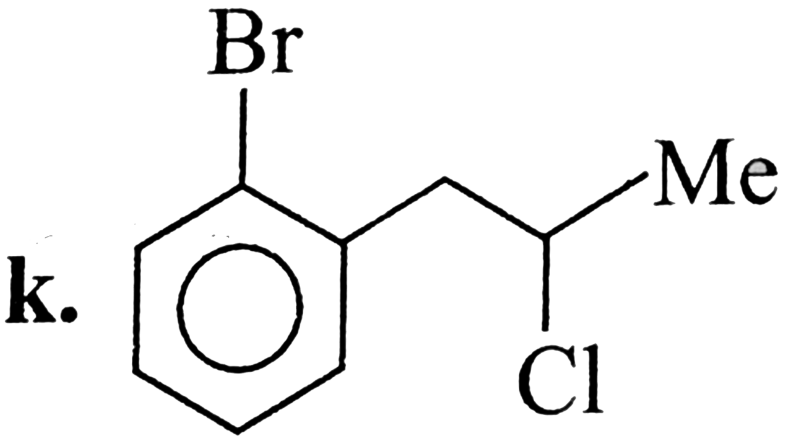
h.



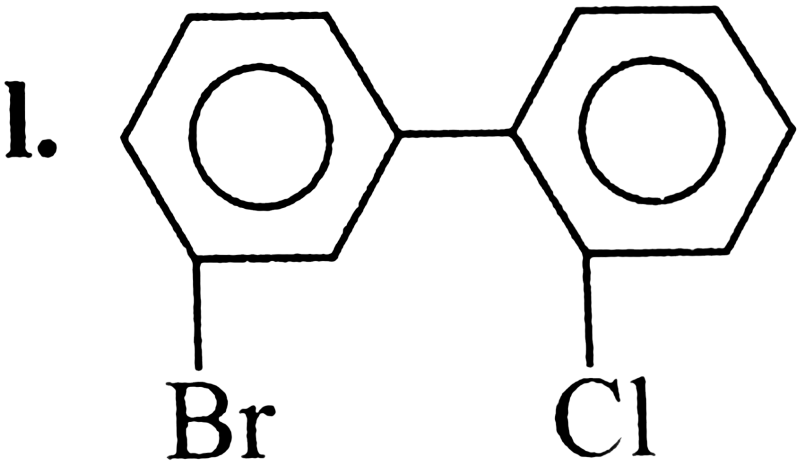


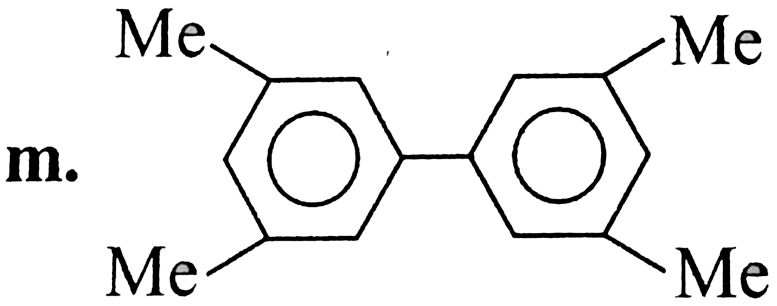
i. , j.



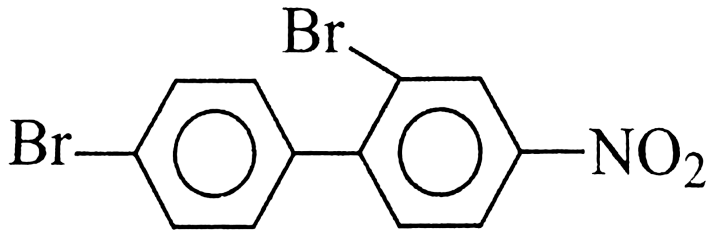


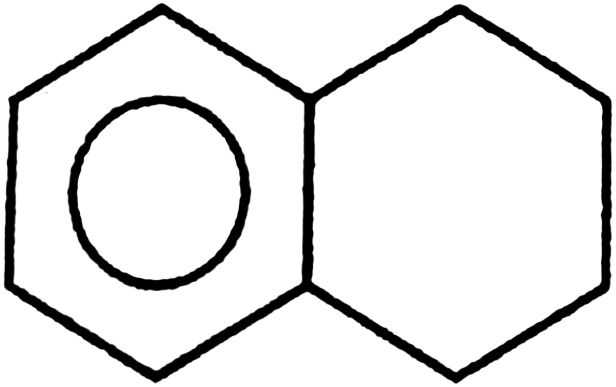
k. , l.



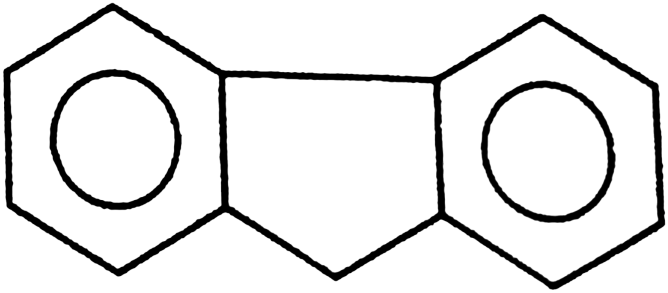


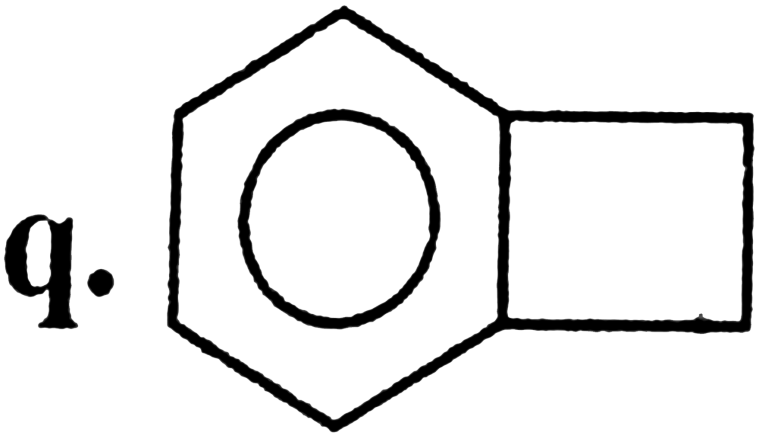
m. , n.

n. 

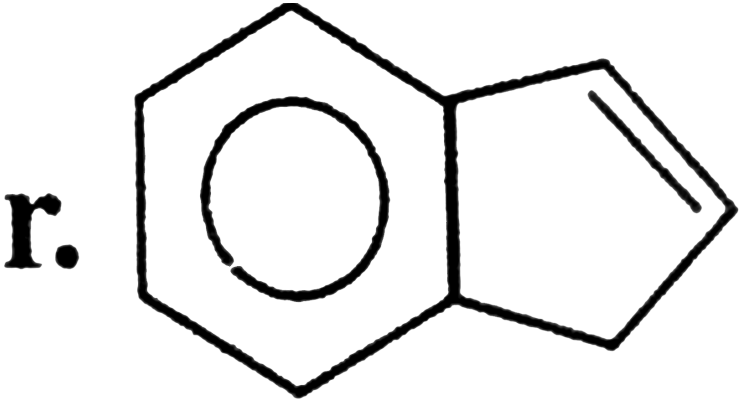
o. 

o. , p.

p. 

q. 

q. , r.

r. 

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5. Write the names and structures of the following compounds: , a. DDT

b. Acteophenone

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

1. ,2. ,3.

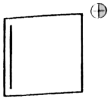
4. ,5

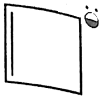
1. 

2. 

3. 

4. 

5. 

6. 

7. 

8. 

9. 

10. 

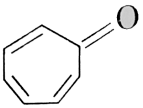
11. 

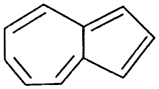
12. 

13. 

14. 

15. 

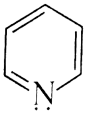
16. 

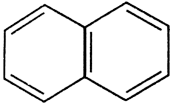
17. 

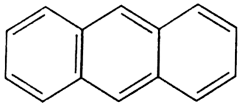
18. 

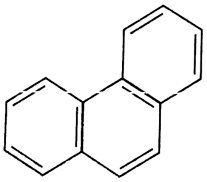
19. 

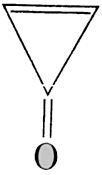
20. 

21. 

22. 

23. 

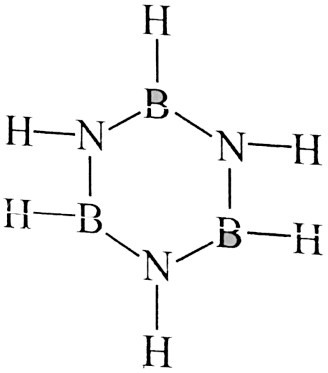
24. 

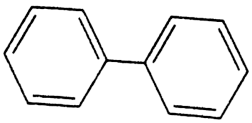
25. 

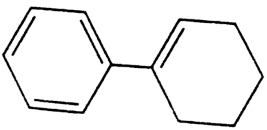
26. $C_9H_9^{\oplus}$

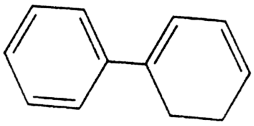
27. $C_9H_9^{\ominus}$

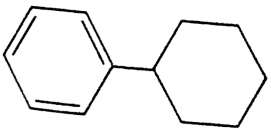
28. C_9H_{10}

29. 

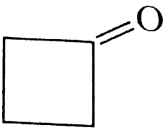
30. 

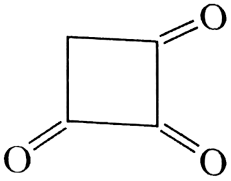
31. 

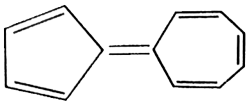
32. 

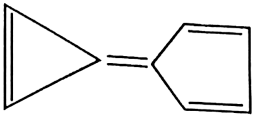
33. 

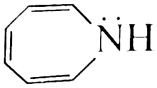
34. 

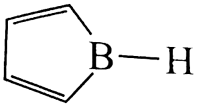
35. Tautomeric form of 

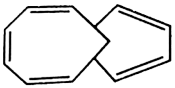
36. Tautomeric form of 

37. 

38. 

39. 

40. 

41. 

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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 $\pi \overrightarrow{e}$'s is not armoatic, whereas tropolone behaves like a phenol.

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

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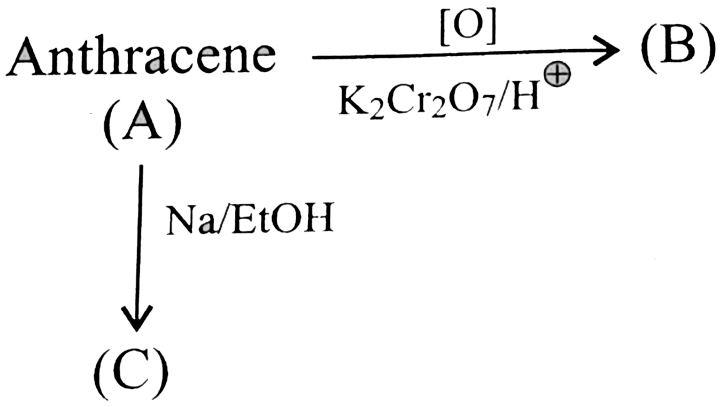
9. a. Compare the following reaction.



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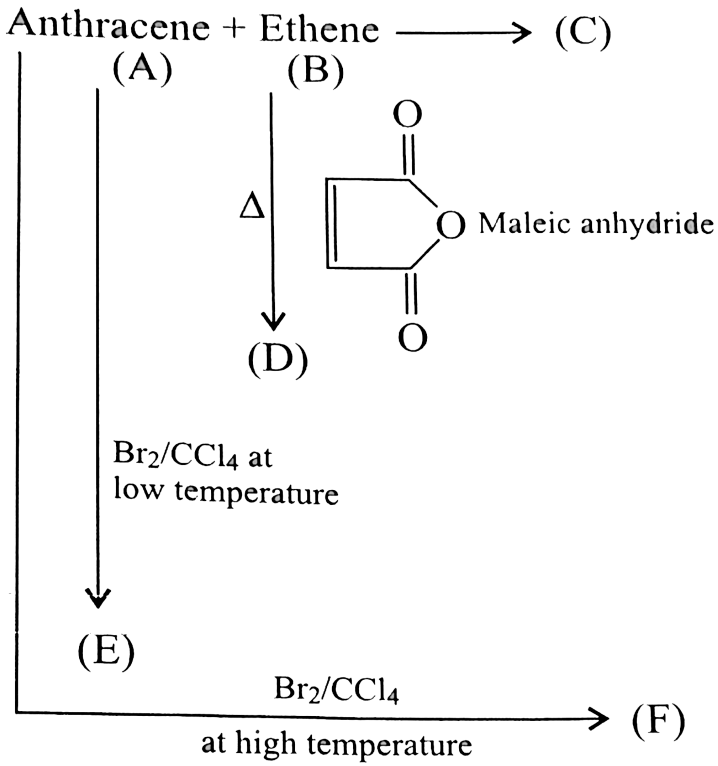
10. Complete the reactions.



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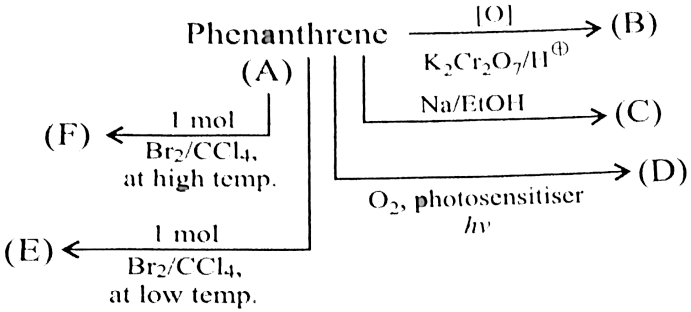
11. Complete the reactions.



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

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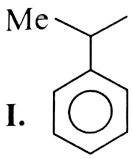
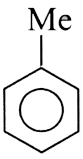
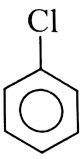
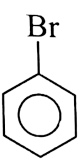
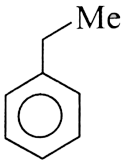
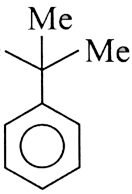
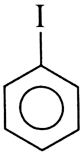
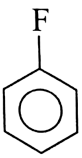
13. Among the following in which cases is the o/p ratio on nitration more the first compound?

a. I.  II. 

b. I.  II. 

c. I.  II. 

d. I.  II. 

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

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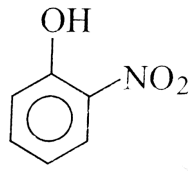
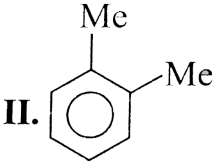
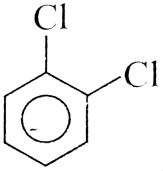
15. Arrange the following in the decreasing of μ.

I. 

II. 

III. 

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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.

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

b. Why are $\bar{e}$ withdrawing groups, [such as $(-NO_2, (-SO_3H), (-CN), (-COOH),$ 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?

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

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

Activating effects of the following $o, p -$ directions:

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

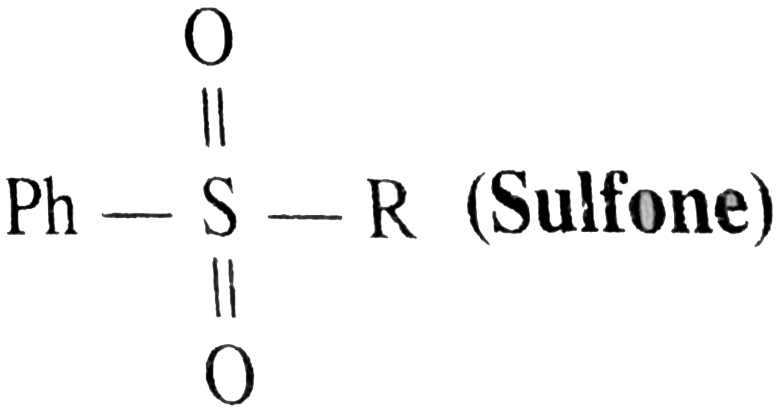
c. Respectivity and orientation of I. $PhOEt$ and II. $PhSEt$

d. Categories the following subsituents as:

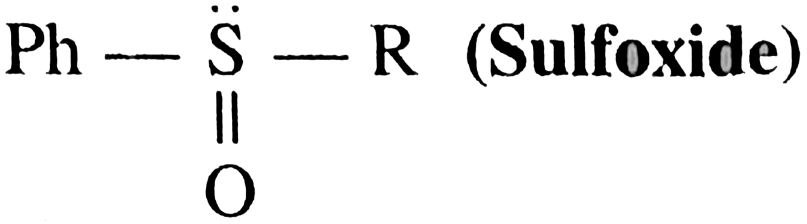
I. Activating,

ii. Deactivating,

iii. o, p, or $m -$ directing.



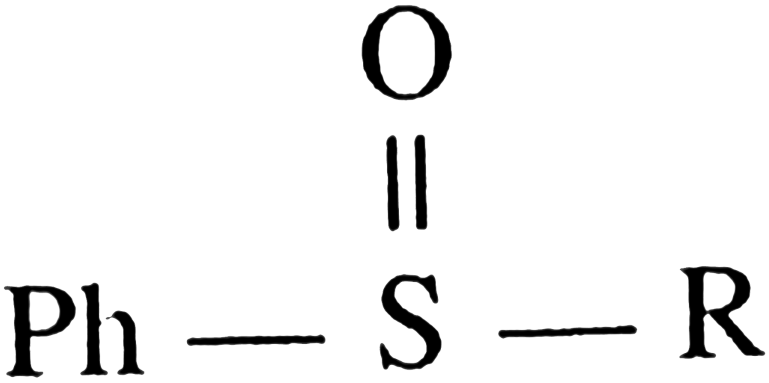
I.



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. PhI`

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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

$H_2S_2O_7$

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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

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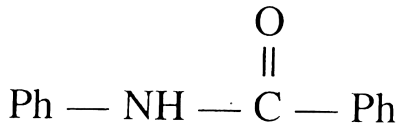
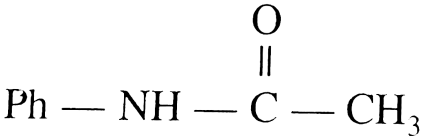
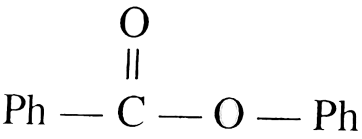
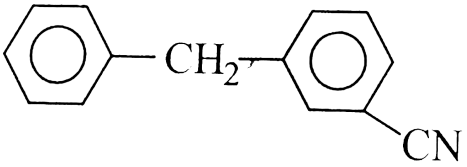
21. Indicate by an arrow the positon(s) where SE reaction takes place in the following:

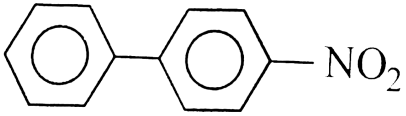
a. 

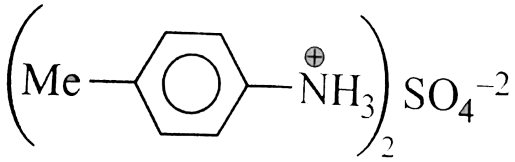
b. 

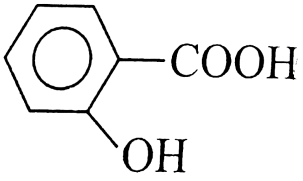
c. 

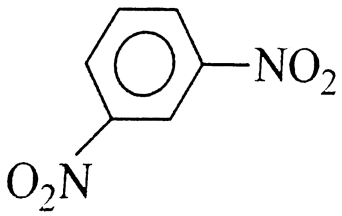
d. 

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

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22. Complete the following reaction:

$$\underset{(A)}{o - HOOC - C_6H_4 - CH_2 - Ph} \xrightarrow{SOCl_2} (B) \xrightarrow[AlCl_3, CH_3Cl]{\text{Anhyd}} (C) \xrightarrow[+HCl]{Zn+Hg} (D)$$

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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?

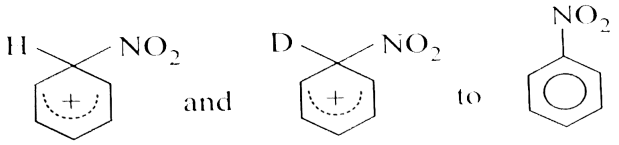
i. An alkene obtained by $E.2$ mechanism

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

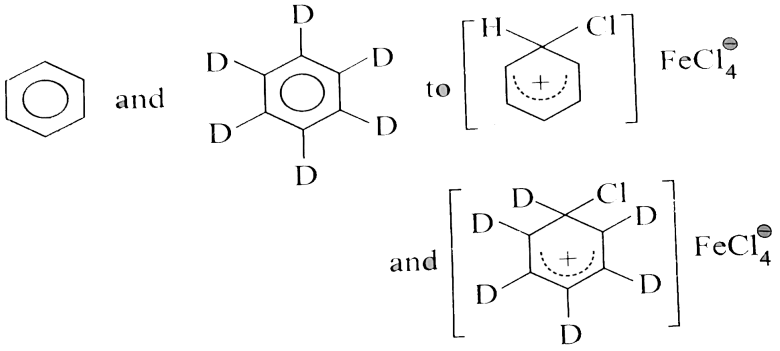
c. Which of the following examples of K_H / K_D (ratio of rate constant) is greater than 1.

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

ii. Conservation of:



iii. Conversion of:



iii. Conservation of:

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24. Convert benzene to adjacent trimethyl benzene.

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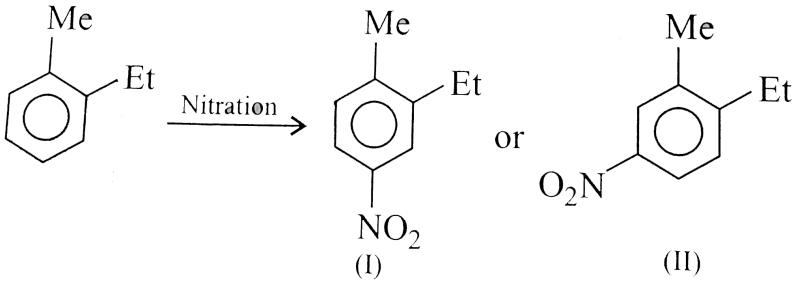
25. a. In the $F.C.$ Alkylation with alkene, why is HF, not HBr, used? How does HF at high temperature effect the dealkylation process?

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 $\left(K_f = xK, kgmol^{-1}\right)$?

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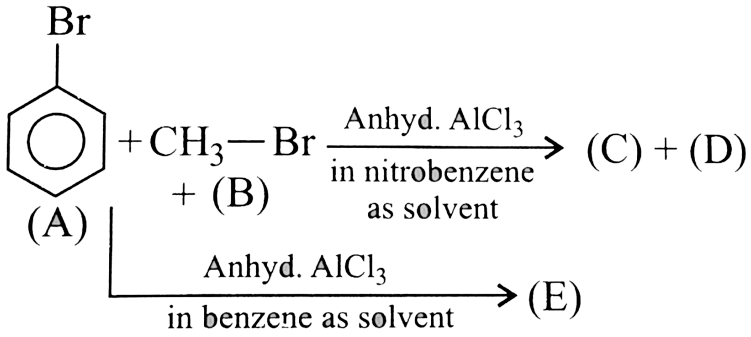
26. Complete the reaction:



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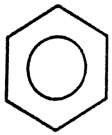
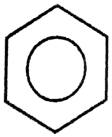
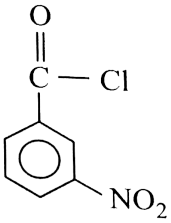
27. Complete the following reaction:

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

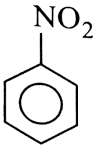
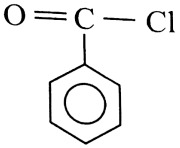
b.  + CH_2Cl_2 $\xrightarrow{AlCl_3}$ (B)

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

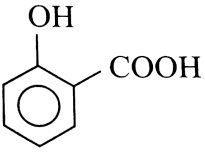
d.  + CCl_4 $\xrightarrow{AlCl_3}$ (D)

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

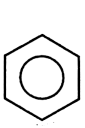
m-Nitrobenzoyl chloride

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

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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.

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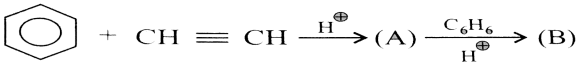
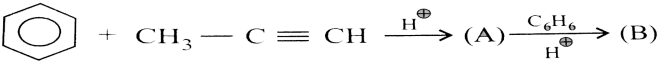
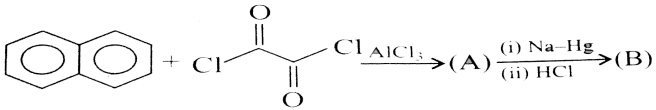
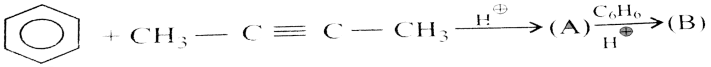
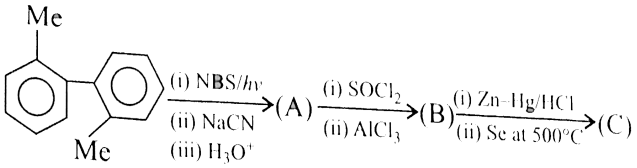
29. Complete the following reaction:

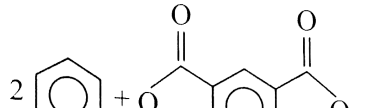
i. 

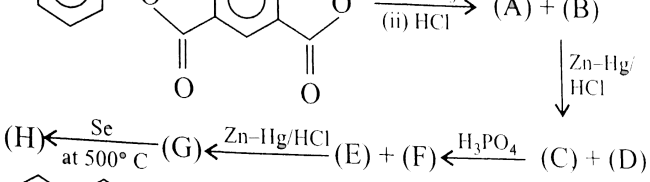
ii. 

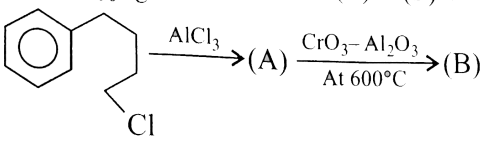
iii. 

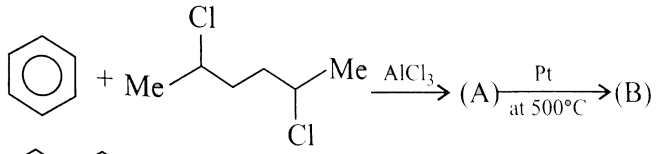
iv. 

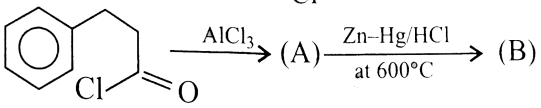
v. 

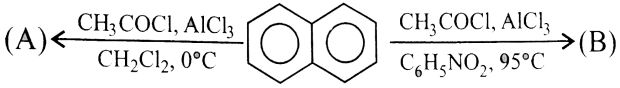
vi. 

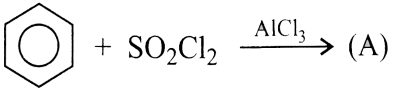


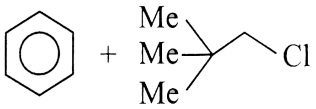
vii. 

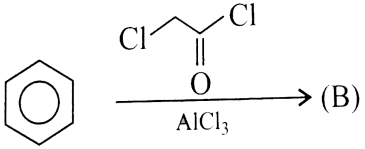
viii. 

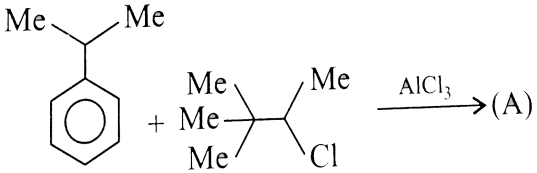
ix. 

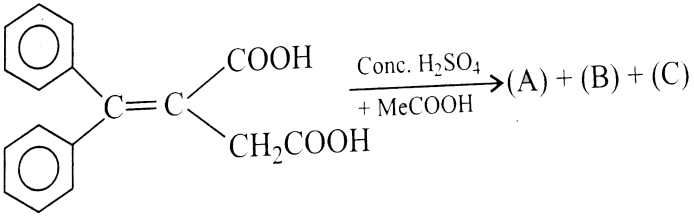
x. 

xi. 

xii. a. 

b. 

c. 

xiii. 

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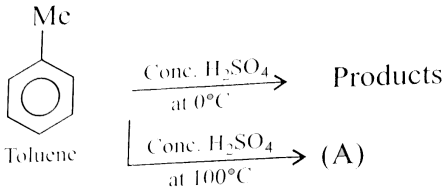
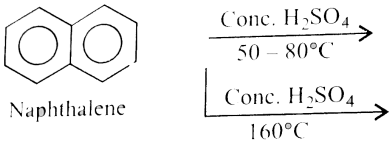
30. Complete the following reactions:

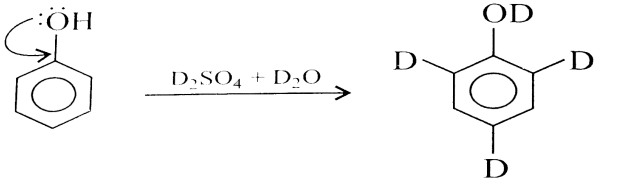
a.



b.

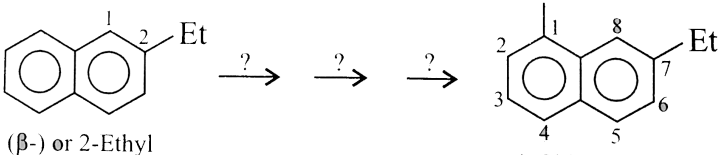


c.



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

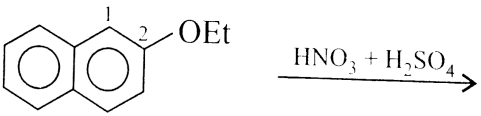
d.



(β-) or 2-Ethyl naphthalene

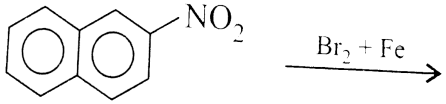
1-Chloro-7-ethyl naphthalene

e.



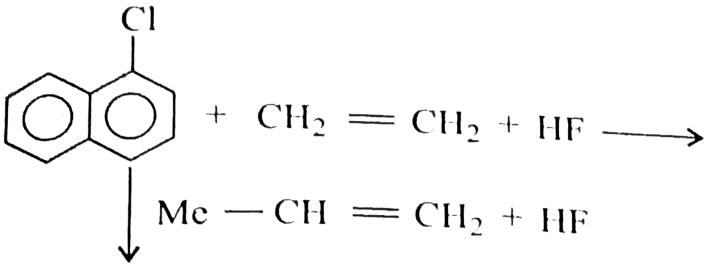
(β-) or 2-Ethoxy naphthalene

f.



(β-) or 2-Nitro

naphthalene

g. 

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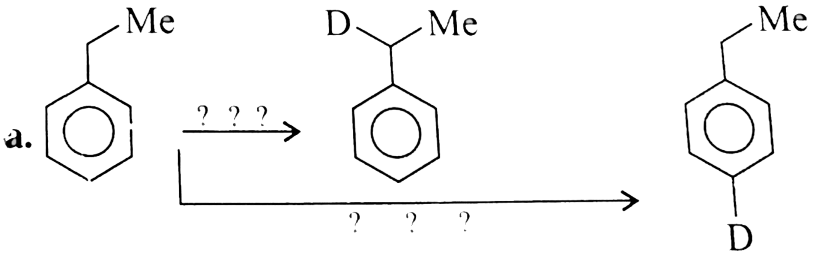
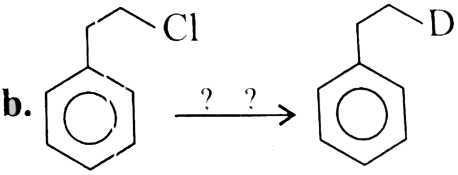
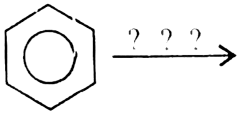
31. Convert the following:

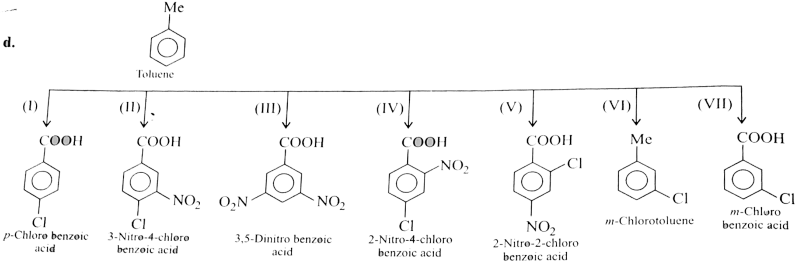
a. 

b. 

c. 

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

d.



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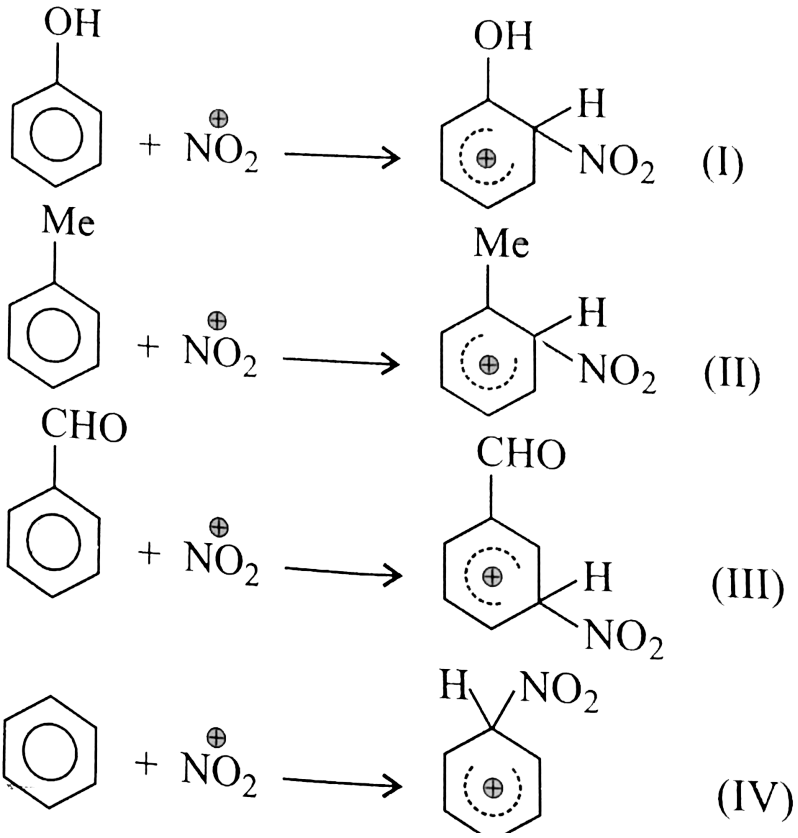
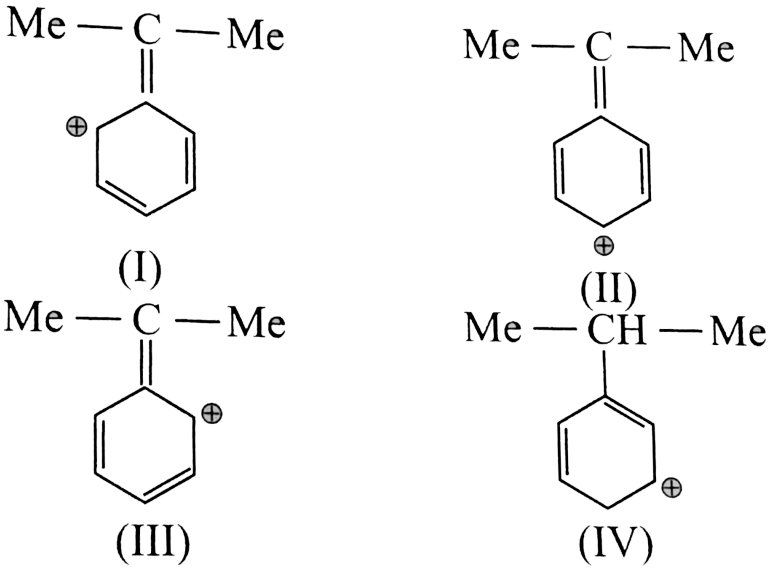
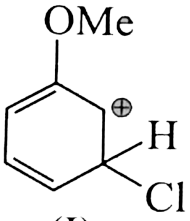
32. Answer the following species $(I - IV)$ according to the decreasing order of potential energy.



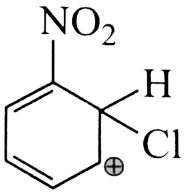
b. Which of the following resonance structures is/are wrong?



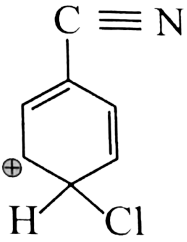
c. Which of the following is/are stable resonating structures?



(I)

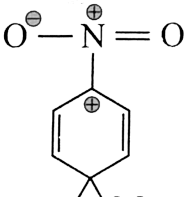


(II)

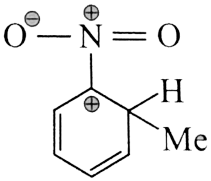


(III)

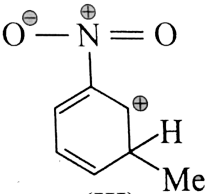
d. Whichof the following is/are least stable arenoinum ion ?



(I)



(II)



(III)

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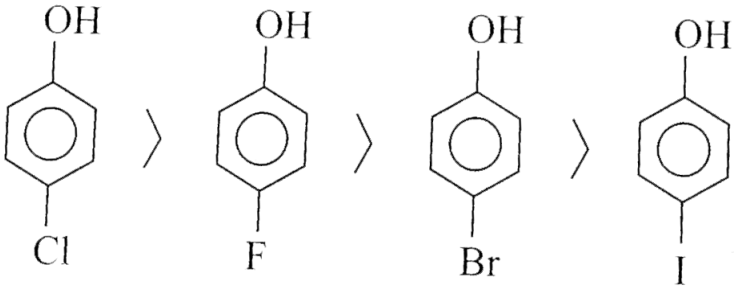
33. Expalin the following:.

. The acidic character fo halogen-substituded pehnol is:



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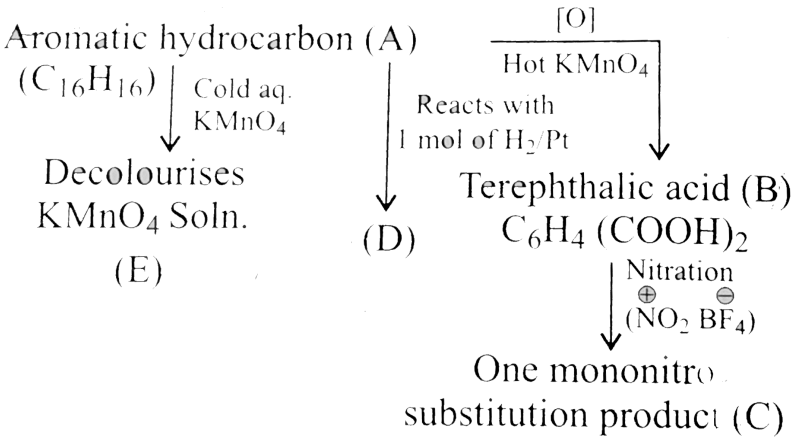

34.

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

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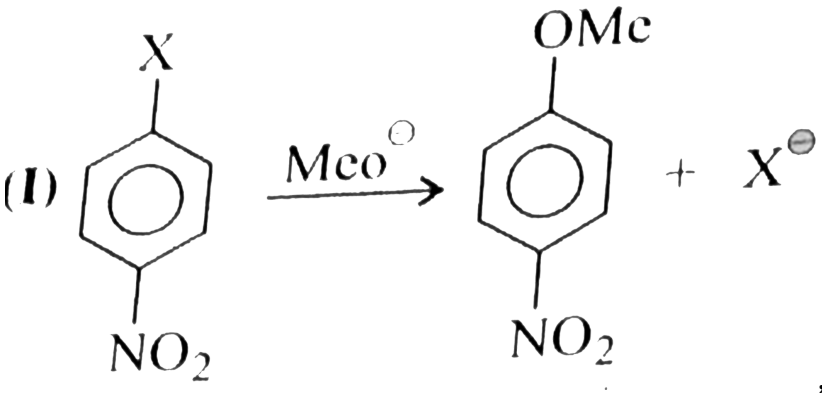
35. For reaction(I)



,why is the order of reactivity of haldies $ArF > > ArCl > ArBr > arl$,although F° is a oor leaving group?Explain.

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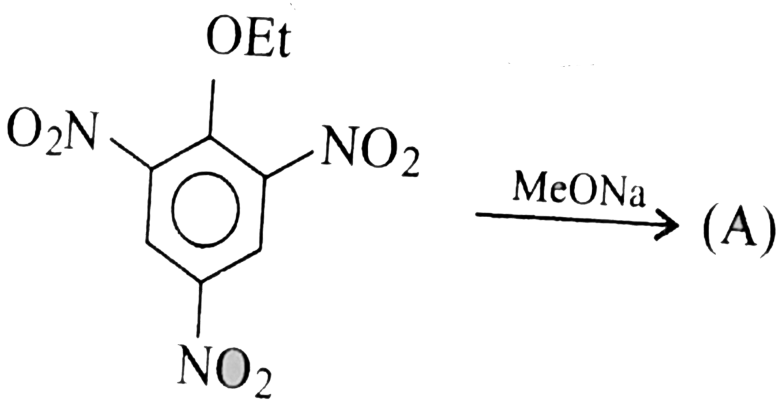

36.

Identify A

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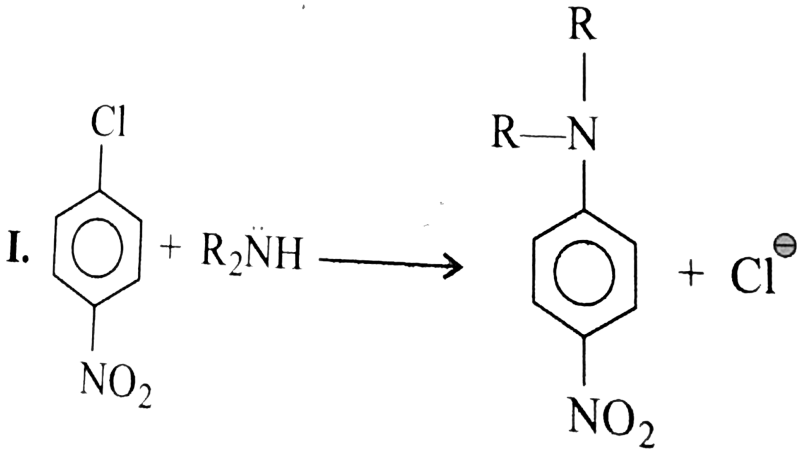
37. Give the decreasing order of reactivity of the following $ArSN$ (addition-elimiantion reaction).



(a) I.

(II)

(b)(III)

(IV)

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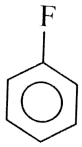
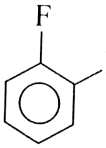
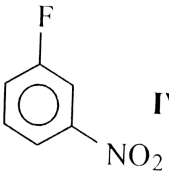
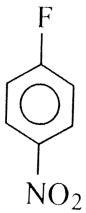
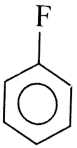
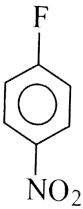
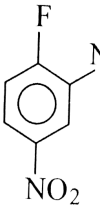
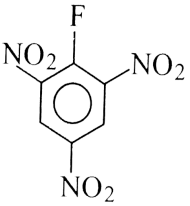
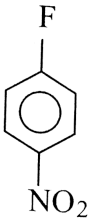
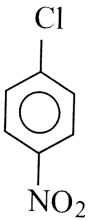
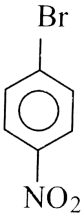
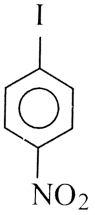
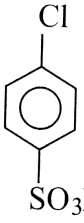
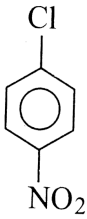
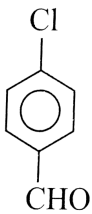
38. Give the decreaes order of $ArSN$ reaction of the following with

a. I.  II.  III.  IV. 

b. I.  II.  III.  IV. 

c. I.  II.  III.  IV. 

d. I.  II.  III.  IV. 

$NaOMe$:

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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 $C-6$

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

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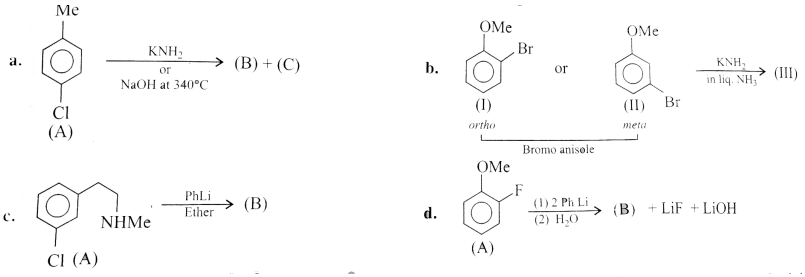
40. Give the reaction and explain the formation of the products.



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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`

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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

i$4-$ tert-Butyl$-3-$ fluoro heptane ,j1iodo$-4-$ ethyl cyclohexane

k$2-$ Fluoro$-3-$ methyl pentane

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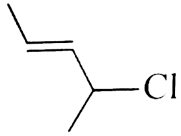
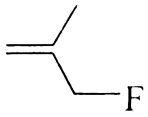
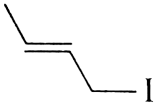
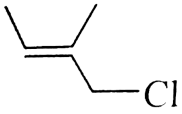
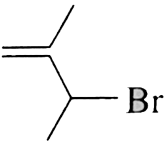
43. Write IUPAC name of the following with(cis or trans)or(EandZ)if any.

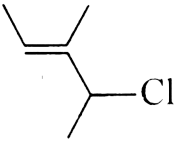
a. 

b. 

c. 

d. 

e. 

f. 

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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 .

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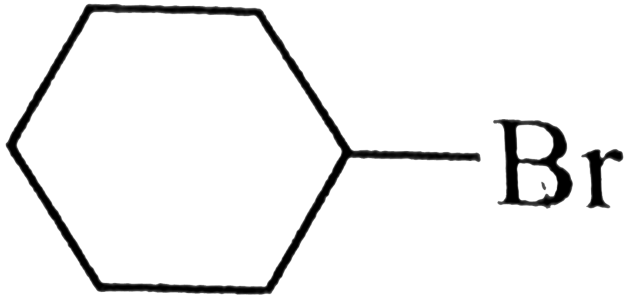
45. a. Assign orientation to the three chlorotounes with $\mu = 1.3, 1.78,$ and $1.9D.$

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. $PhBr$?

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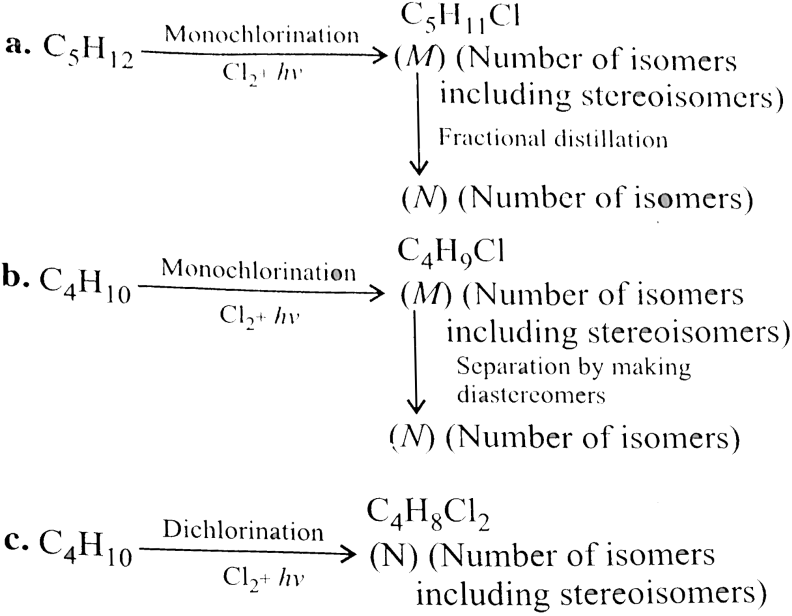
46. What are the numerical values of (M) and (N) in the following reaction ?



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

I. Benzyl methyl ether (A)

II. Phenylethyl ehter (B)

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48. a. An armatic compound $(A)(C_7H_8O)$ on reaction with $Br_2 + H_2O$ gives a white ppt. of compound $(B)(C_7H_5Obr_3)$. Compound (C), an isomer of (A) also gives the same reaction and gives a white ppt. of compound $(D)(C_7H_5OBr_3)$. 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 $\xrightarrow{\overset{\ominus}{OH}} (A) \rightarrow (B) + Cl$

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

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

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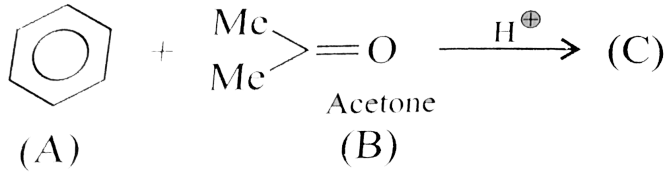
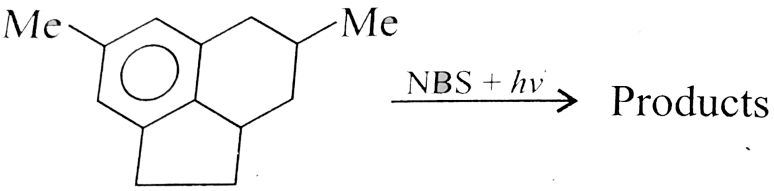
50. a.Complete the following:

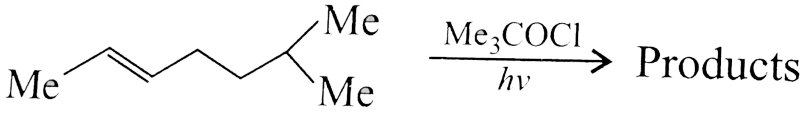


b.



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.

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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 $(C_2H_5)S > (C_2H_5)_2O$.

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 $(A)(Ph_2CHC(OH)Me_2)$ with SbF_5/SO_2.

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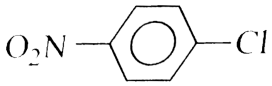
52. a. The dipole moment of HBr is $2.6 \times 10^{-30} C.m$ and intertomic spacing is 1.41Å. What is the percent ionic character of HBr ?

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

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

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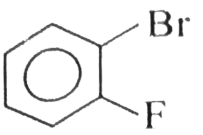
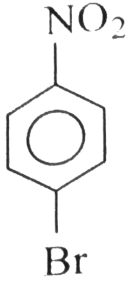
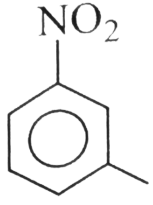
53. Complter the following:

f. 

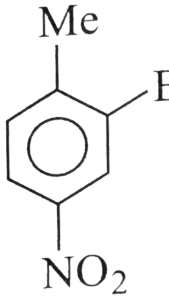
$\xrightarrow{Li/Hg}$ (F)  (G)

g. 

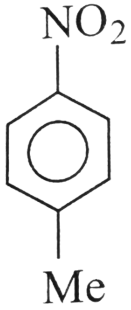
$\xrightarrow[C_2H_5OH]{KCN,\ \Delta}$ (H)

h. 

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

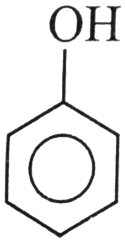
i. 

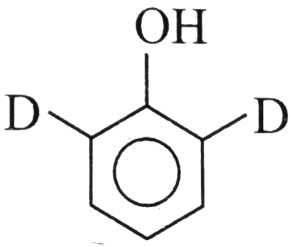
$\xrightarrow[C_2H_5OH]{NaCN,\ \Delta}$ (J)

j. 

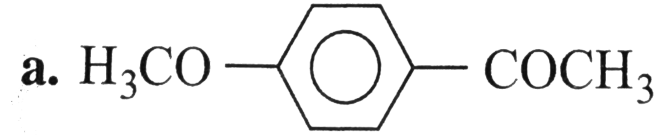
$\xrightarrow{Br_2,\ Fe}$ (K) $\xrightarrow[(ii)\ H_2O]{(i)\ KCN}$ (L)

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?

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

1. $(CH_3)_3CBr + C_2H_5OH$ at $60^\circ \rightarrow \underset{(\text{Major})}{(CH_3)_3C - OC_2H_5} + \underset{(\text{Minor})}{(CH_3)C = CH_2}$

2. $CH_3CH_2CH_2Br + LiAlH_4 \rightarrow$

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

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

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

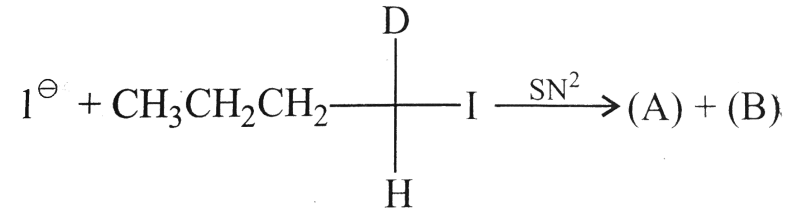
6. $CH_3CHBr \rightarrow CH_3 + \overset{\ominus}{O}H(\text{Ethanol}) \rightarrow$

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

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. $(CH_3)_2C(Br) - C_2H_5$ ii. $C_5H_{11}Br$.

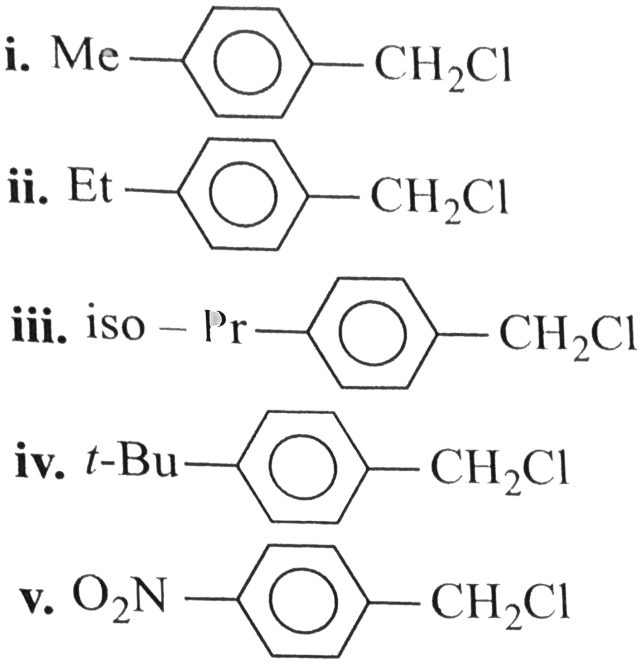
iii. $C_2H_5CH(Br)C_2H_5$.

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. $CH_3CH(CH_3)CH_2CH_2I$

v. $CH_3CH(CH_3)CHICH_3$

vi. $CH_3CI(CH_3)CH_2CH_3$.

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. $\overset{\ominus}{O}H$, 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. 3gt1gt2gt4c. 3gt2gt1gt4, d. 4gt2gt1gt3

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

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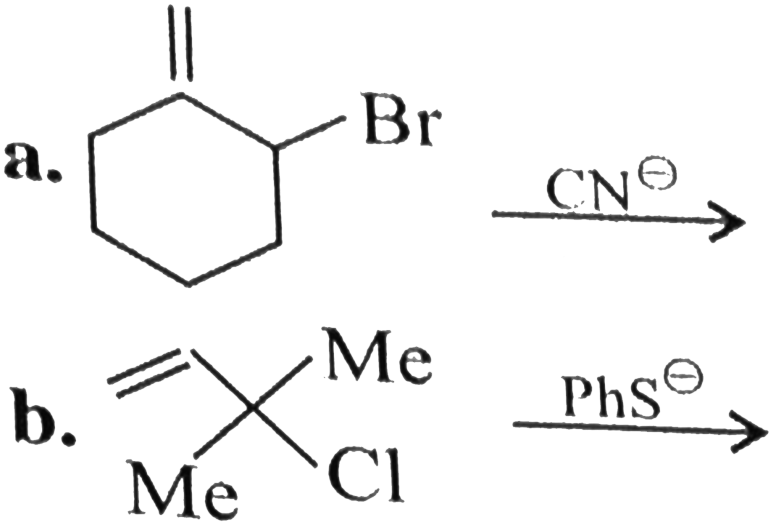
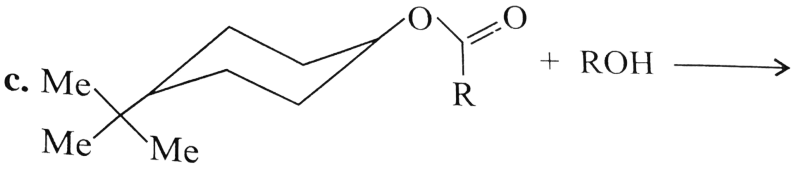
55. Explain why solvolysis (where the solvent is nucleophillic) appears to follow a first-order rater law, rather than a secound order.

II. Complete the following:



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



IVgt Why is PhO° a weaker nucleophile than RO° ?

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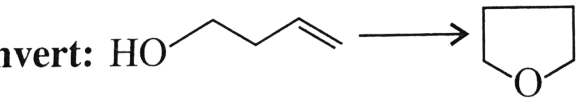
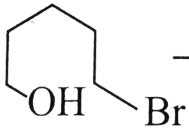
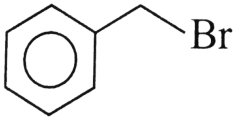
56. I. $5-$ Chloro$-1.3-$ cylopentadience undergoes SN^{-1} solbolysis in the persence of Ag' ion slowly, even though chlorine is doubly allylic, and allylic halides normally ionise reasily. Expalin.

II. **Convert:** 

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

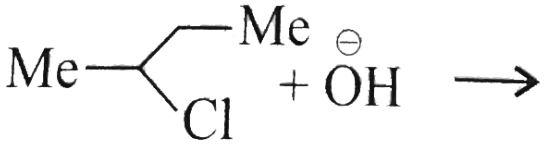
$\xrightarrow{\text{Base}}$ (A)

b. 

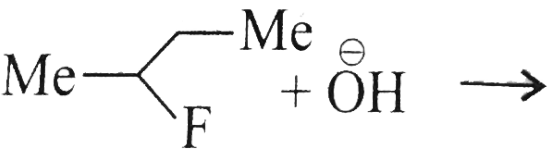
$\xrightarrow[SN^1]{C_2H_5O^{\ominus}}$ (B)

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.

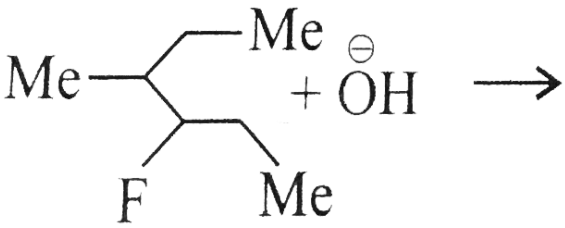
V. Give the major major products of the following elimination reactions:

a. 

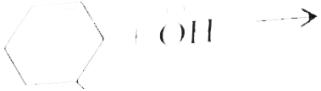
$\longrightarrow$

b. 

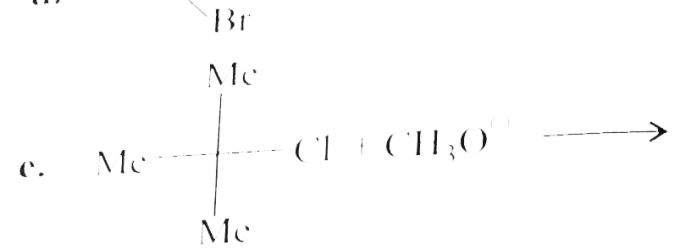
$\longrightarrow$

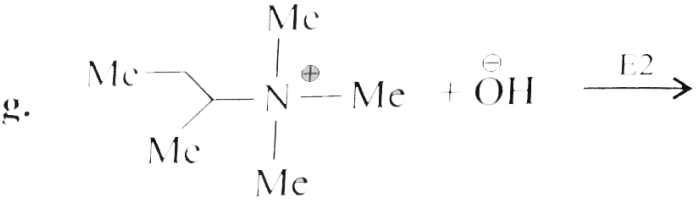
c. 

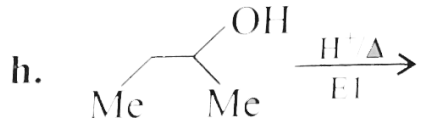
$\longrightarrow$

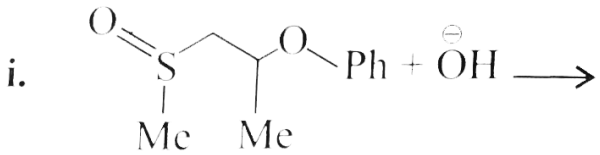
d. 

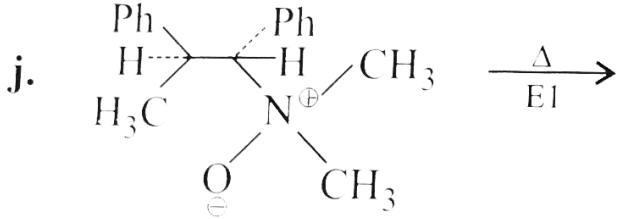
$\longrightarrow$

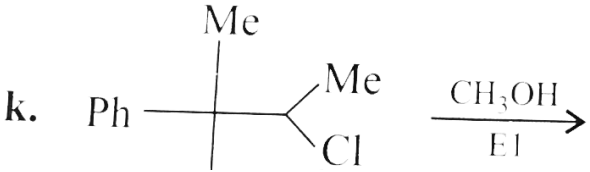

Br
e.
Me
Me
Me
Cl + CH_3O^-
f.
Me
Me
Me
O^- + CH_3X


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

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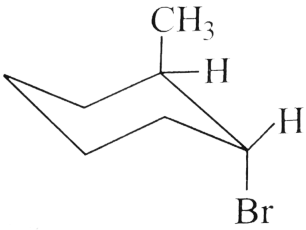
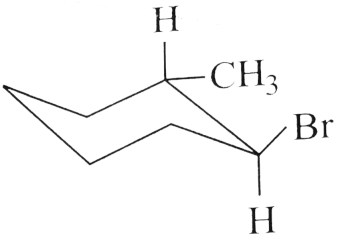
57. I. Which of the following will solvolyse faster is SN^{-1} and why?



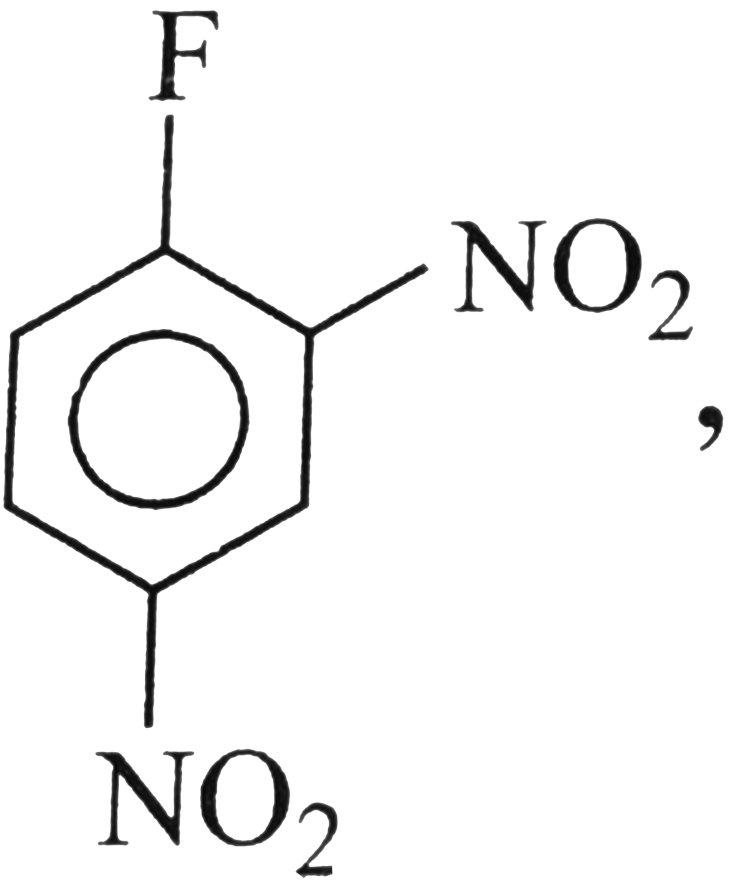
(A)

and

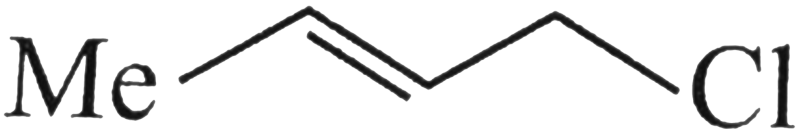


(B)

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.

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Solved Examples

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

Mesitylene $> m-\mathrm{Xylene} > o-$ and $p-$ Xylenen gt Toulene gt Benzene

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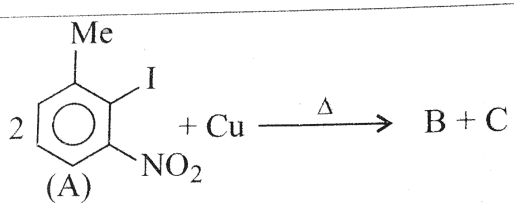
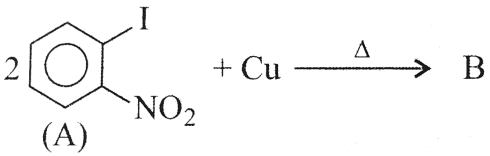
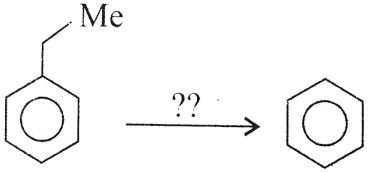
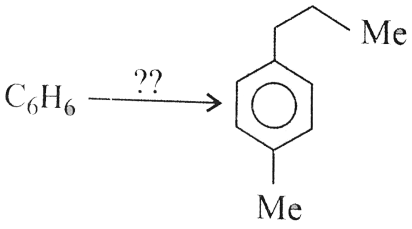
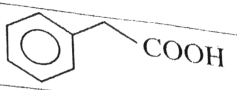
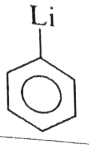
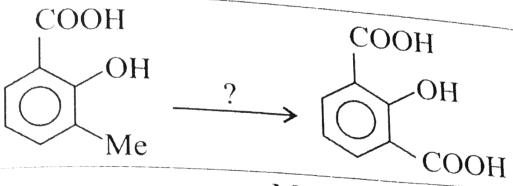
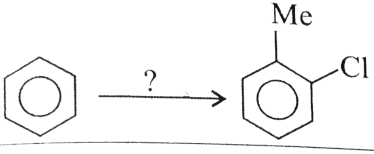
2. Complete the following :

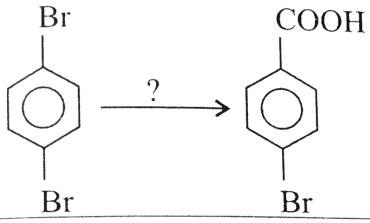
a.	
b.	
c.	
d.	

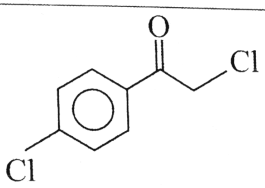
e. $C_6H_6 \xrightarrow{?}$ 

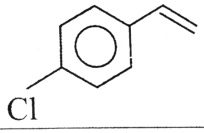
f. $C_6H_6 \xrightarrow{?}$ 

g. 

h. 

i. 

j. $C_6H_6 \xrightarrow{?}$ 

k. $C_6H_6 \xrightarrow{?}$ 

l. $C_6H_6 \xrightarrow{?} PH-CH \equiv CH$

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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 ?

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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, $III.$ $O\overset{\oplus}{H}$, 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) - MeIII. m-MeOC_*(6) H_(4) - MeIV. p-MeO - C_(6)H_(4) - Mec. I. PhNH_(2), II. PhNHCHOCH_(3)III. PhNHCOPh, IV. PhNHTsd. 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)`

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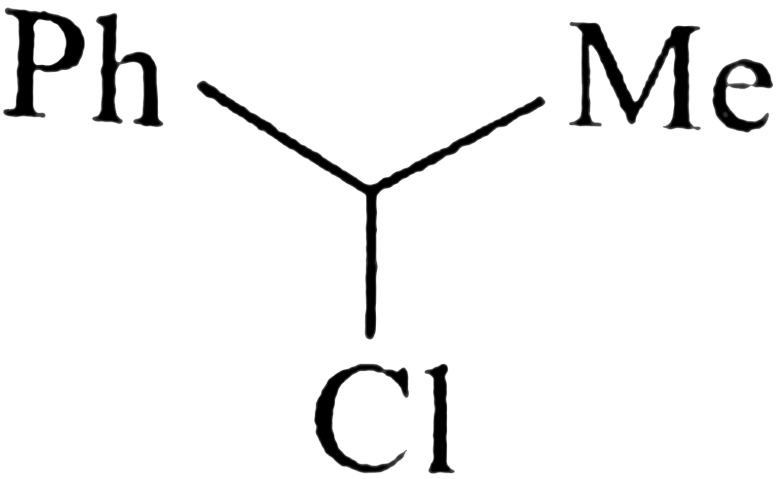
5. Distingulish between the following compounds:

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.



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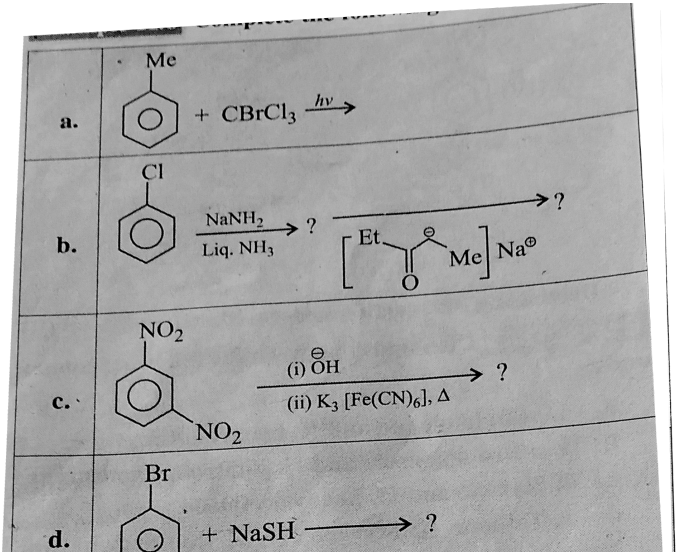
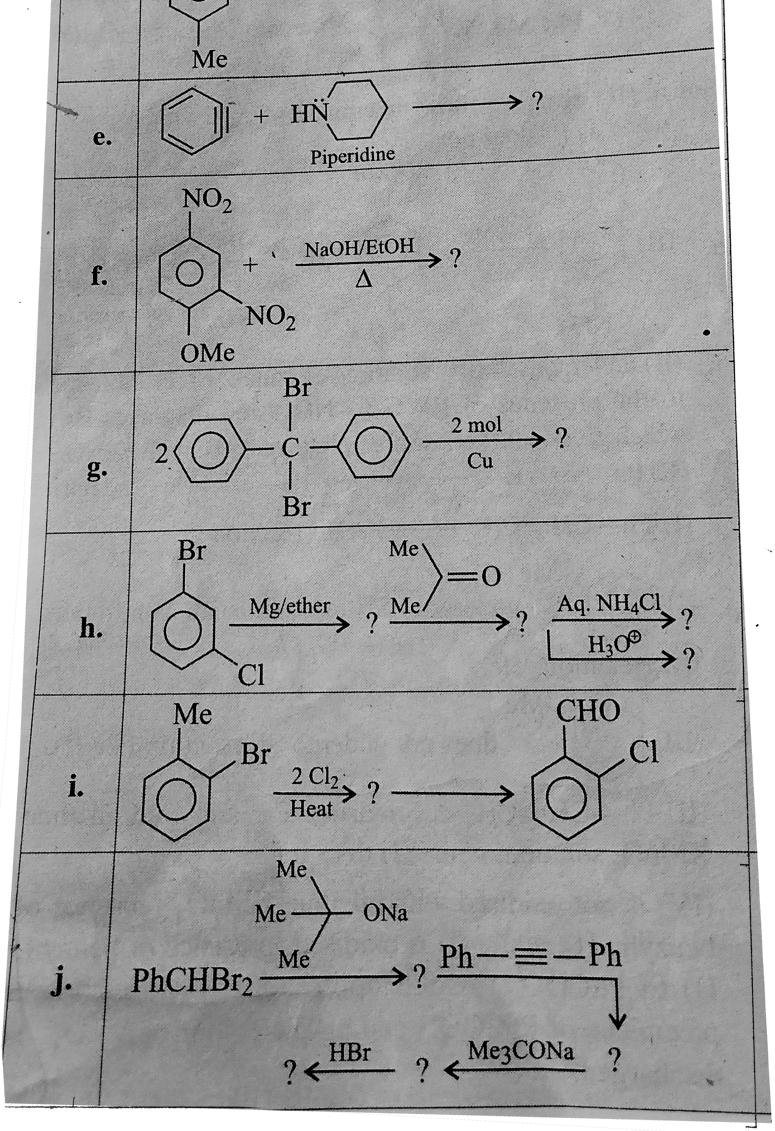
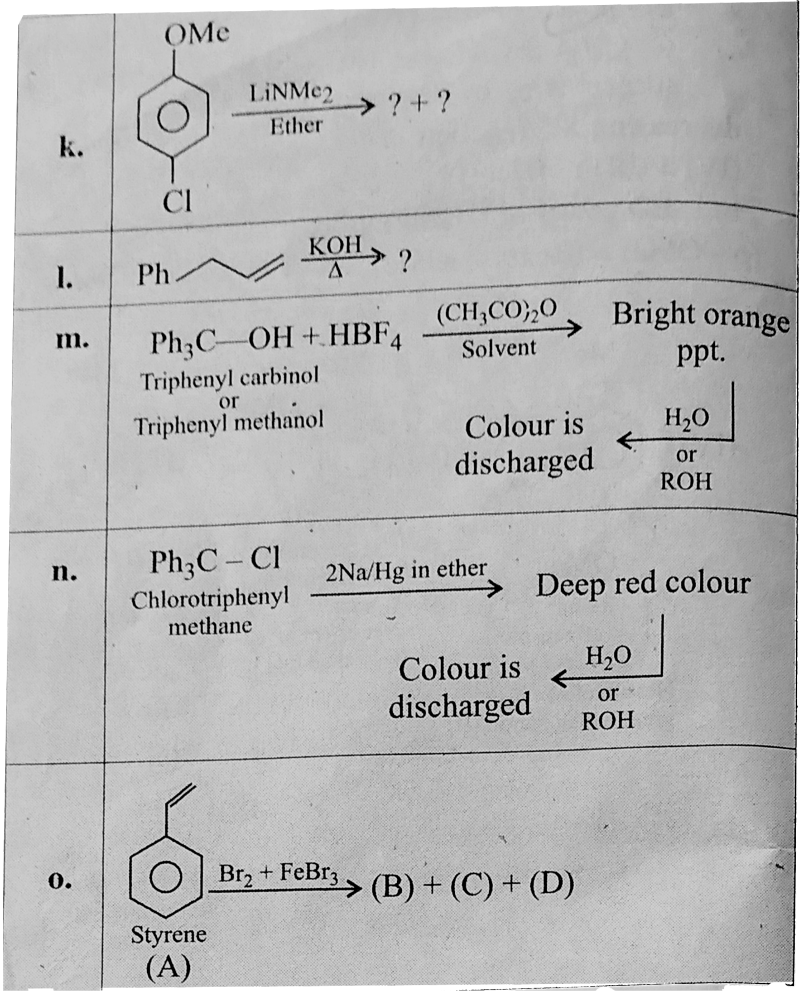
6. Complete the following reactions:




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
?



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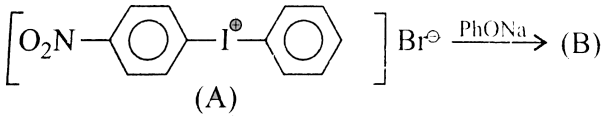
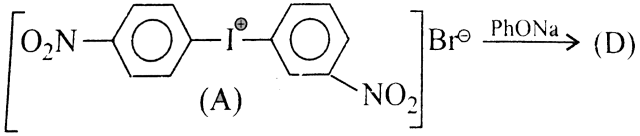
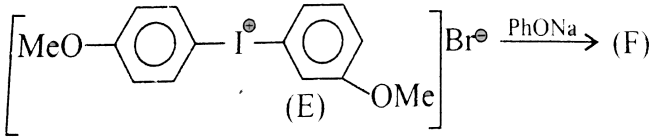
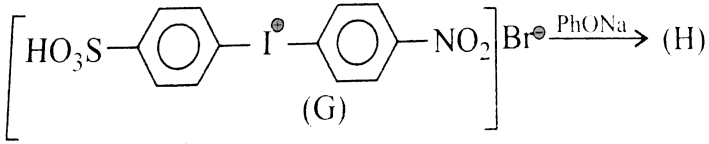
7. Indicate the position where $ArSN$ reaction will take place and explain why.

a. 

b. 

c. 

d. 

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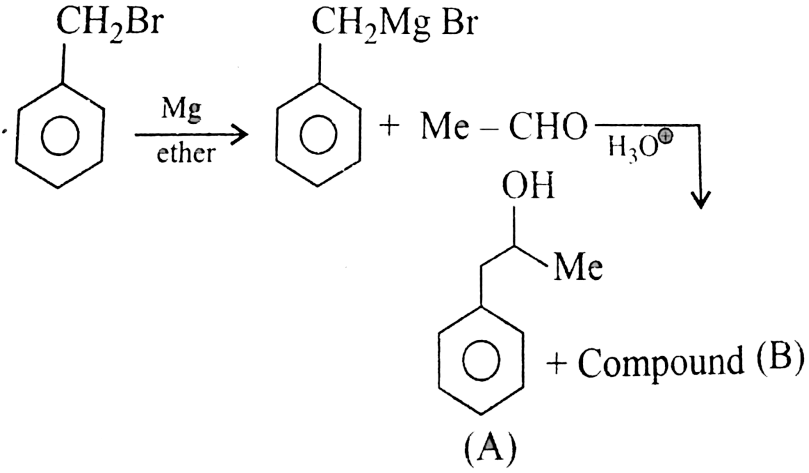
8. 

Compound (B) is an ismoer of $(A0$. Compound (B) shows positive

iodoform test and gives $o-$ toule acid. What is (B) ? Explain its formation.

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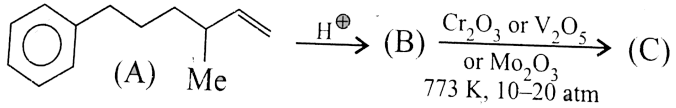
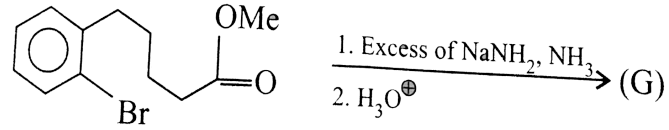
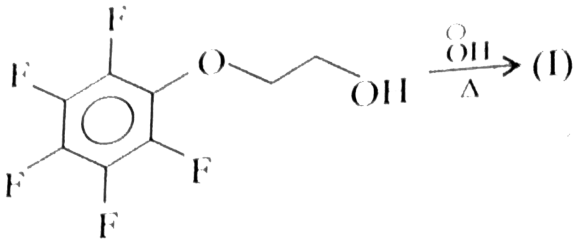
9.

a. 

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

c. 

(F)

d. 

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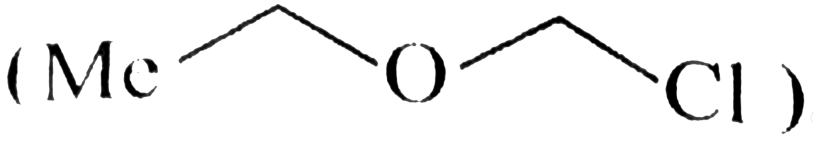
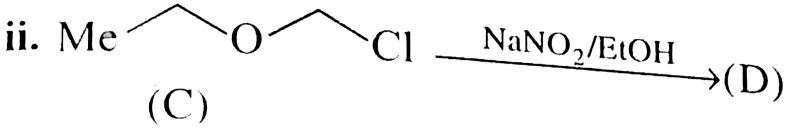
10. a. Account for the rapid rate of ehanoulysis id



, although it is $1^{\oplus}$ halide.

Explain the following reactions:

ii. 

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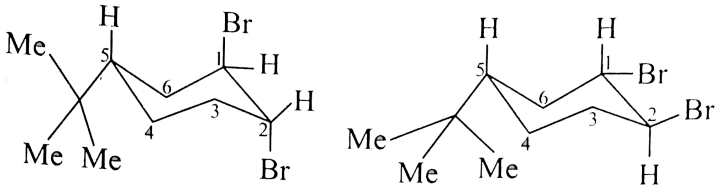
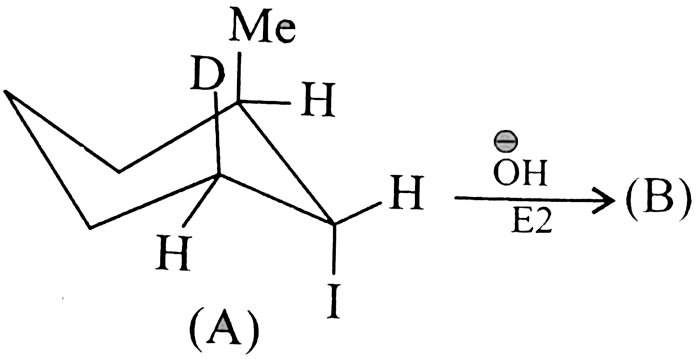
11. I. Give the product of debromnination of with Kl in acetone solution of the folloiwing.

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:



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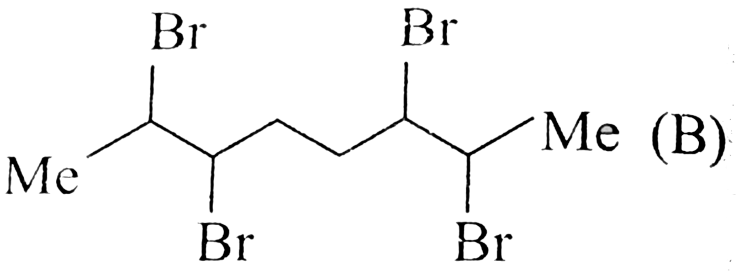
12. Syntesise the following:

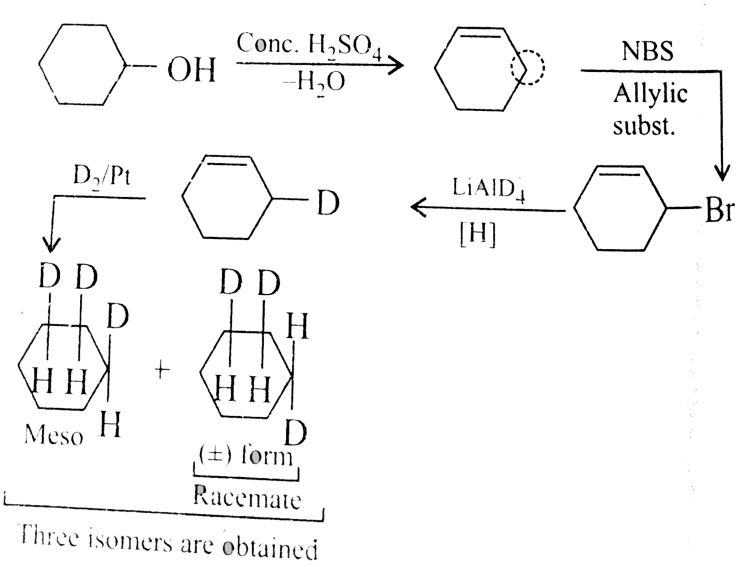
a. Cyclohexanol (A) to $1, 2, 3-$ tridenuterocy cloxane (B).

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?

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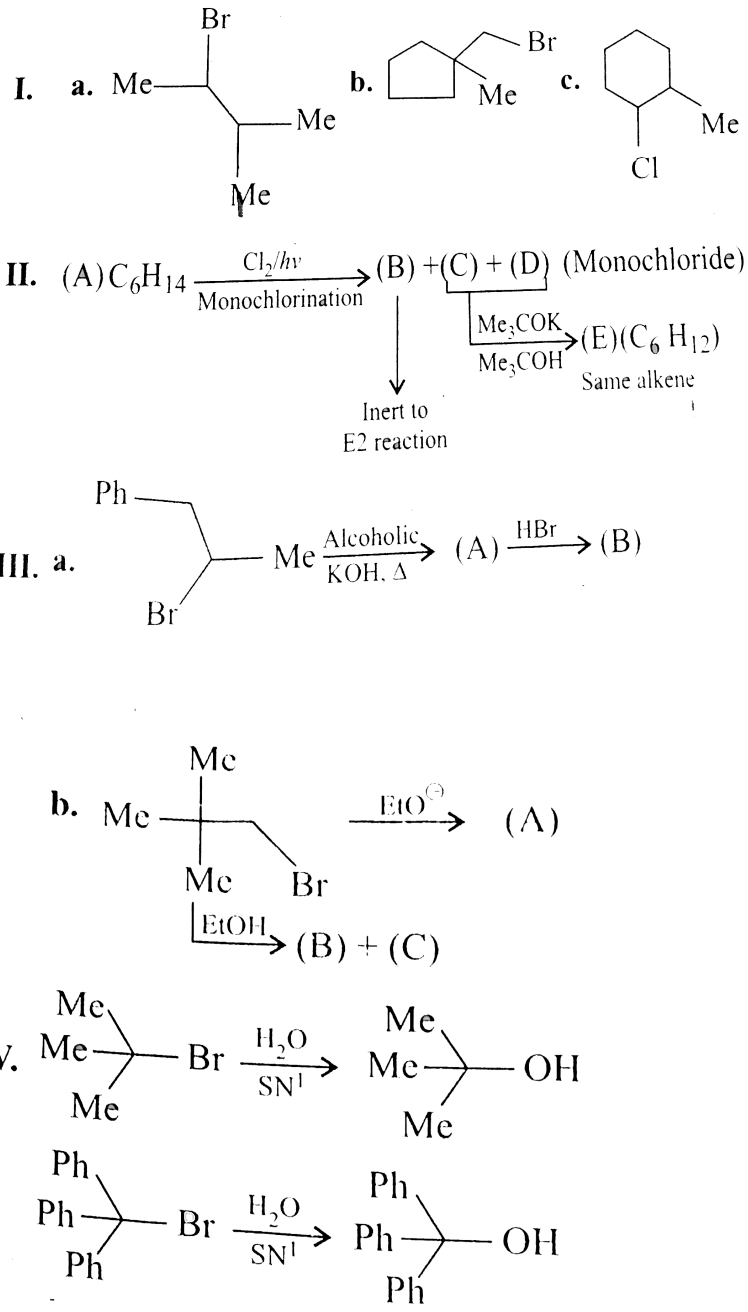
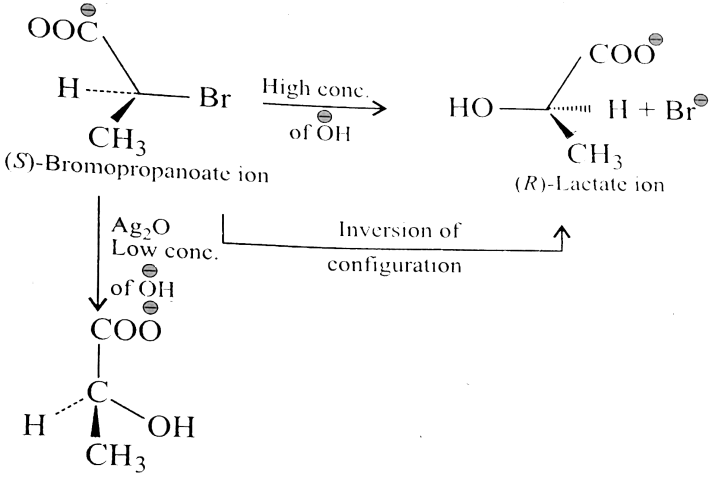
13. Give the majore product, when the following compounds are treated with sodium methoxide.



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.



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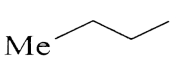
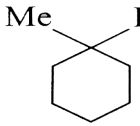
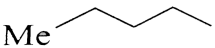
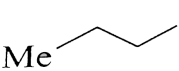
14. I. Which of the following solvents is the reaction faster?

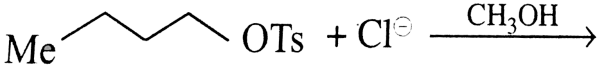
a.  + NH_3 in 20% CH_3OH and 80% H_2O or 40% CH_3OH and 60% H_2O.

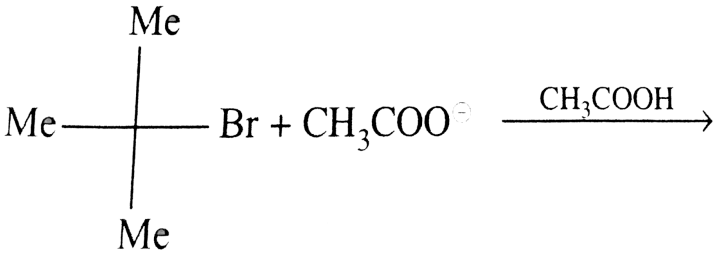
b.  in CH_3OH or EtOH.

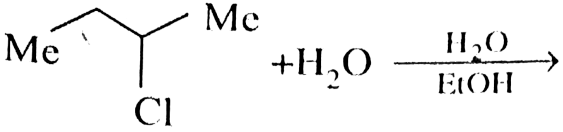
c.  + $\overset{\ominus}{O}H$ in CH_3OH or 50% CH_3OH + 50% H_2O.

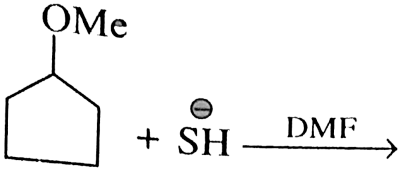
d.  + $:\overset{\ominus}{C} \equiv N:$ in EtOH or DMSO.

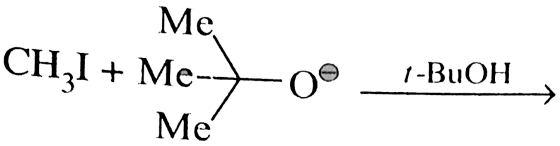
II. Indicate SN^{-1} or SN^2.

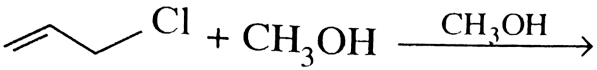
a. 

b. 

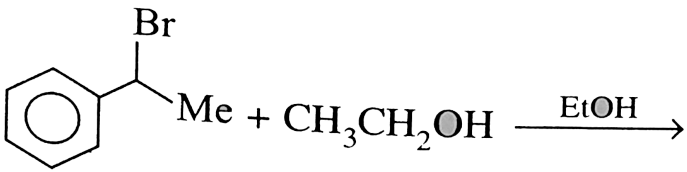
c. 

d. 

e. 

f. 

g. 

h. 

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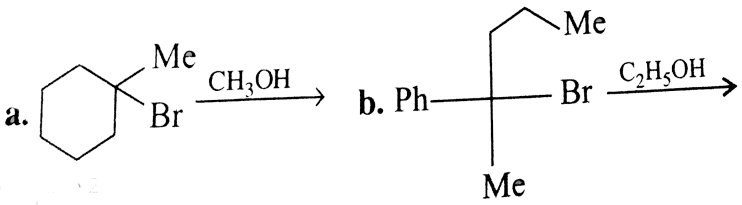
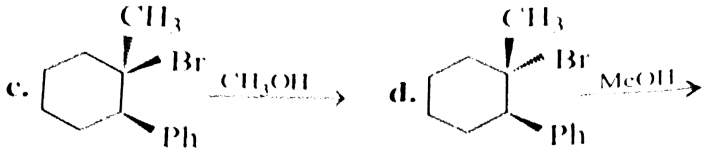
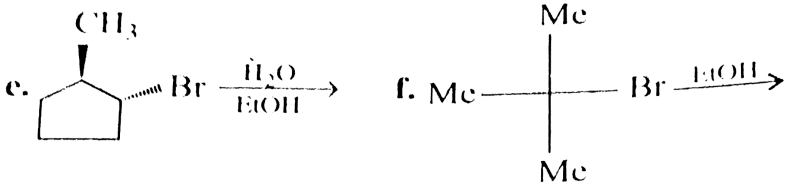
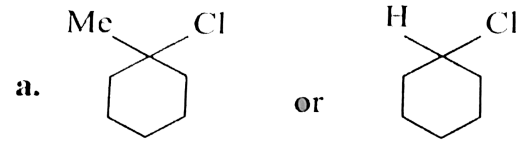
15. I. Give the products of the following:

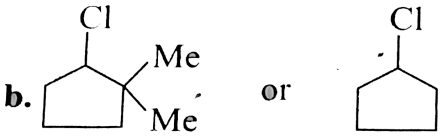


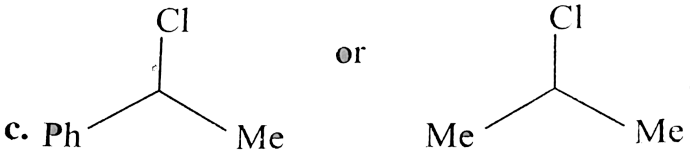




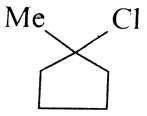
II. Which has faster rate of SN^{-1}?

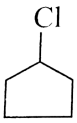


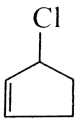


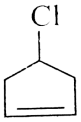


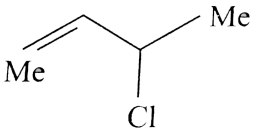
III. Which has faster rate of SN^{-1}?

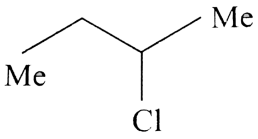
a. 

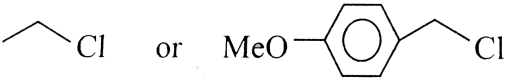
or 

b. 

or 

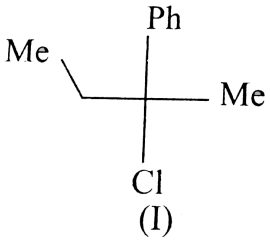
c. 

or 

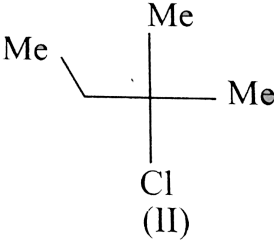
d. 

IV. Give the decreasing order of:

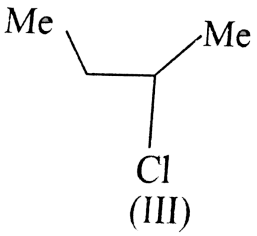
a. SN^1:



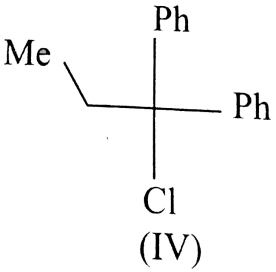
(I)



(II)



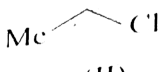
(III)



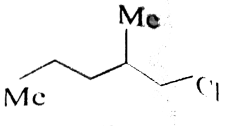
(IV)

b. SN^2:

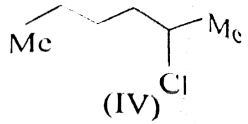
(I)



(II)

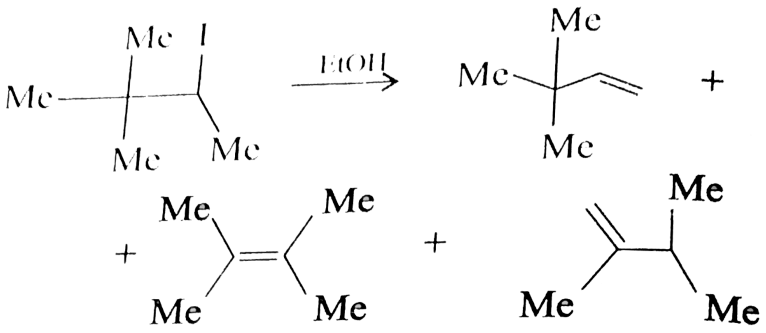


(III)



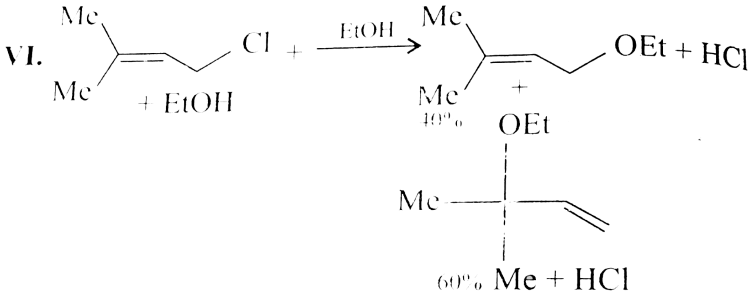
(IV)

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

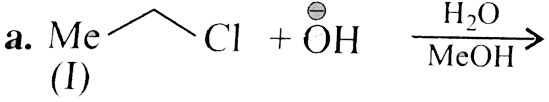


Explain teh formtaion and mechanism.

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

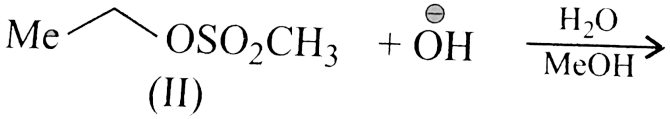


VIII. What are the products of the following reactions?

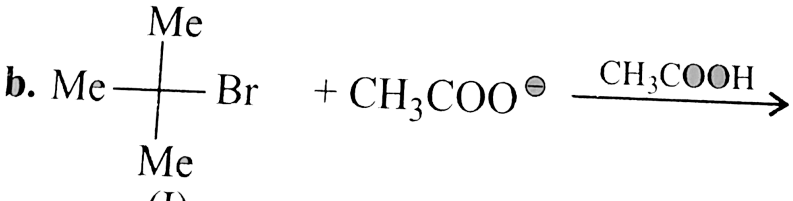
a. 

(I)

or

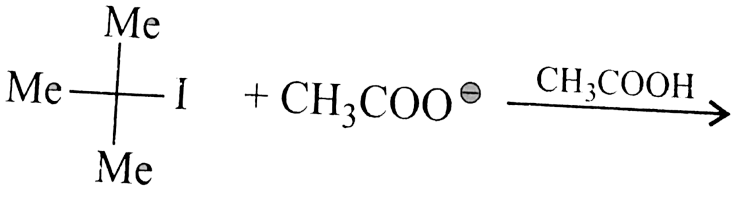


(II)

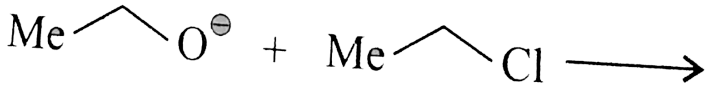
b. 

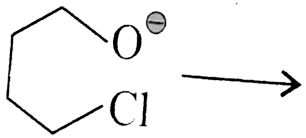
(I)

or

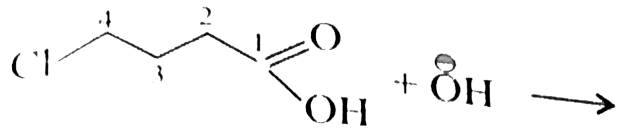


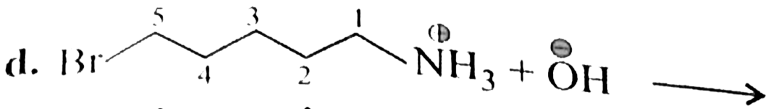
(II)

a. 

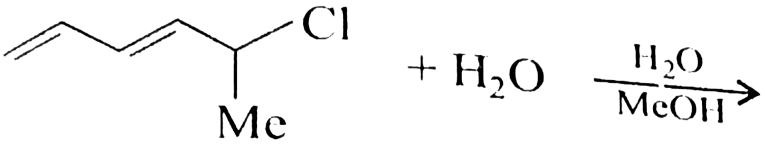
b. 

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

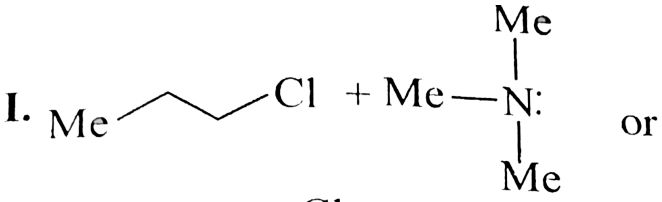
c. 

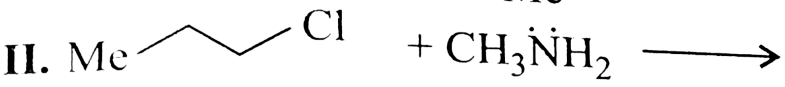
d. 

b. Which has faster rate?

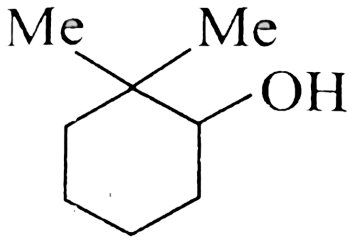


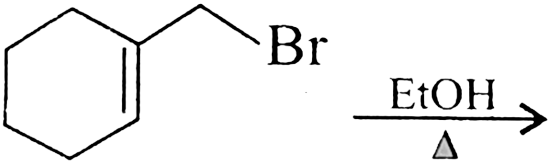
X. GIve teh products of the following:

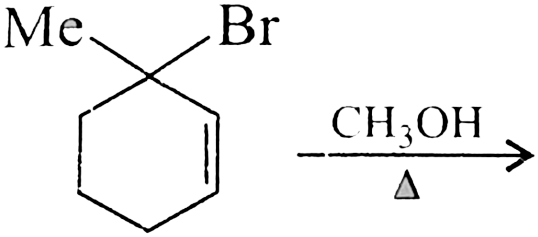
I. 

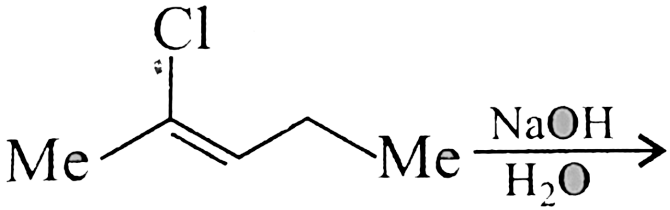
II. 

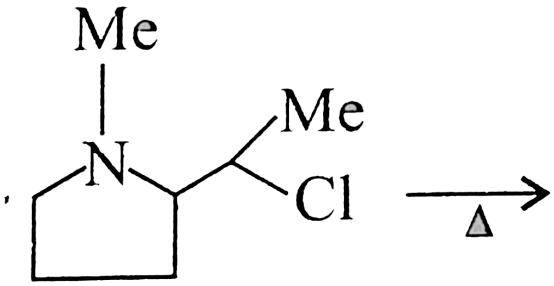
XI. Which is more reactive towards acid-catalysed hydration and explain the regiochemistry of the alchohol formed.

a. 

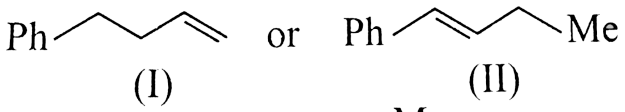
b. 

c. 

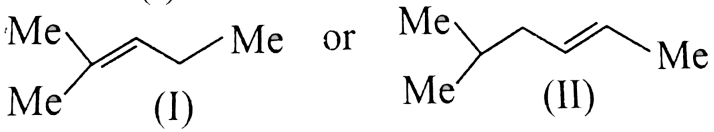
d. 

e. 

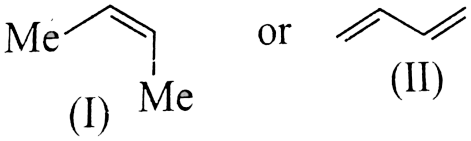
XII. Which hydrolyses at faster rate?

a. 

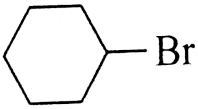
(I) (II)

b. 

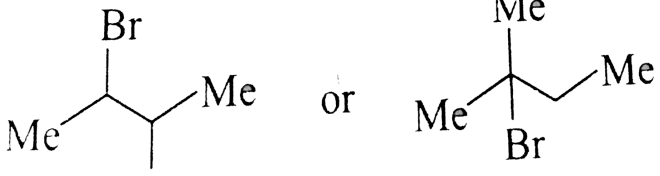
(I) (II)

c. 

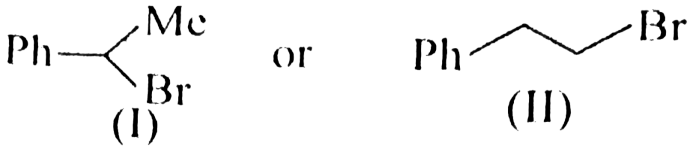
(I) (II)

a. PhBr or 

(I) (II)

b. 

(I) (II)

c. 

(I) (II)

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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).

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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 $NaCl\frac{\emptyset}{N}aOH$ gives an antiseptic (G). Idntify (A) to (G).

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18. An organic compound (A) having C = 16.27%,H = 0.677%, Cl = 72.203% reduces Fehling solution and on oxidation gives an acid (B) having C = 14.679%, H = 0.612% and Cl = 65.137%. (B) on distillation with sodalime gives a sweet smelling liquid (C) which contains 89.12% chlorine. (C) can also be obtained by heating (A) with alkali. (A) can also be obtained by the action of Cl2 on C_2H_5OH. Identify (A), (B) and (C) and explain the reactions.

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19. Benzene reacts with CH_3I in the presence of $AlCl_3$ to give compound $(A)(C_7H_8)$ 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 $(F)(C_6H_4NBr_3).(F)$ reacts with $NaNO_2$ adn HCl and forms

$(G)(C_6H_2N_2Br_3Cl)$. Additiaon of Kl froms (H) Indenitify the compounds (A) to (H).

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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).

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21. An organic compound $(A)(C_9H_{12})$ gave $(B)(C_8H_6O_4)$ 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 $(C)(C_8H_5BrO_4)$. WHat are (A), (B), and (D) ?

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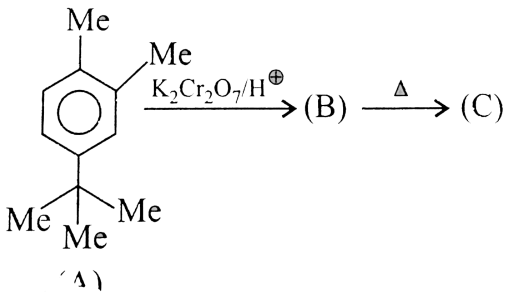
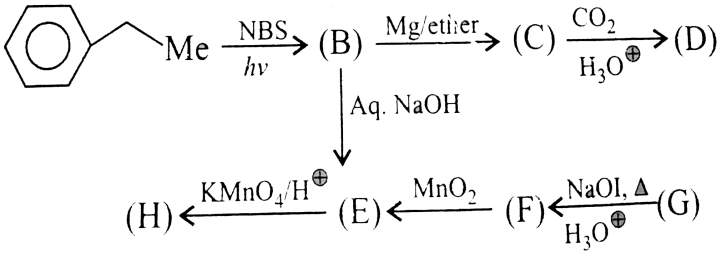
Solved Problems

1. Complete the following reactions:

a.



b.



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

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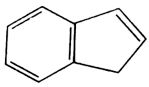
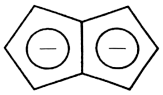
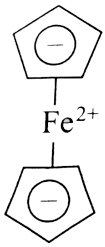
2. Cycloocta $-1,3,5,7-$ tetrane (A), a non-armatic compound reacts with 2 mol potassium to from a stable compound (B) without producing. H_2. Write the structure of (B) and explain the reason for its stability.

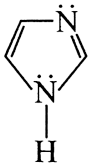
View Text Solution

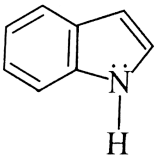
3. Select the aromatic, anti-aromatic, and non-aromatic compounds.

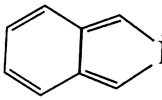
a.  (Indene)

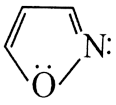
b. 

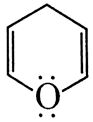
c.  (Ferrocene)

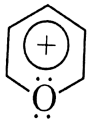
d.  (Imidazole)

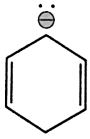
e.  (Indole)

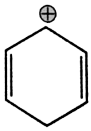
f.  (Isoindole)

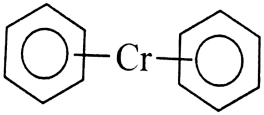
g. 

h.  (Pyran)

i. 

j. 

k. 

l.  (Dibenzene chromium)

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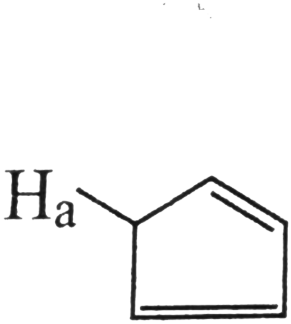
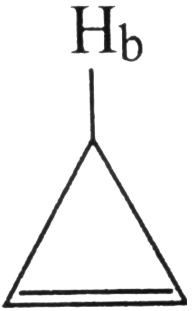
4. Answer the following :

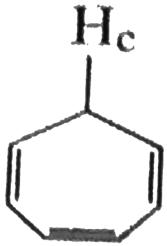
a. Which of the following H will have lower pK_a value in the given compound?



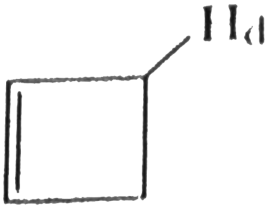
(I)



(II)

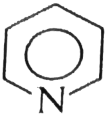
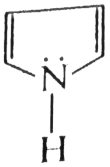


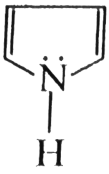
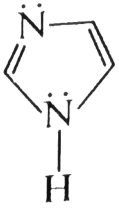
(III)



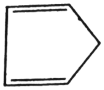
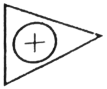
(IV)

b. Which of the following have lower pk_b value?

i.  (Pyridine) and  (Pyrrole)

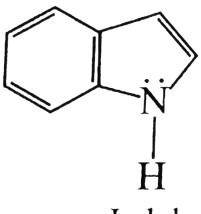
ii.  (Pyrrole) and  (Imidazole)

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

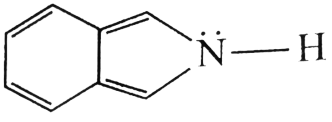
i.  (I)  (II)  (III)

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?

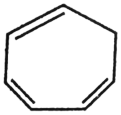

Indole
(I)

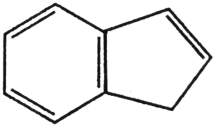
and


Isoindole
(II)

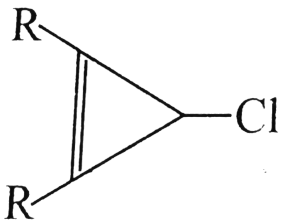
e. What of the decreasing order of pk_a values of the following?

I. $HC = CH$

II. 

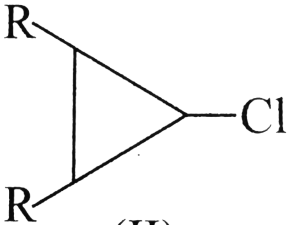
III. 

f. Which of the following has highest K_a value?

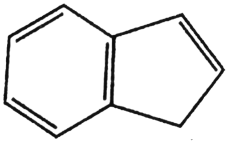
i. 

(I)

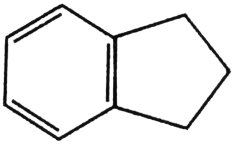
or



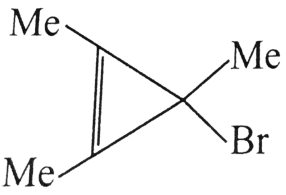
(II)

ii. 
(I)

or

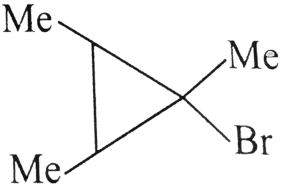

(II)

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



(I)

or



(II)

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5. Distinguish chemically between the following:

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

ii. (a) Benzene, (b) Naphthalene

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

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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.

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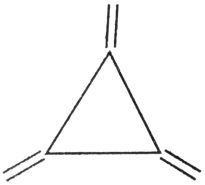
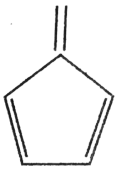
7. Some alternate strucres proposed for benzene are given. Indicate for each of them how many (i) mono and (ii) di-substuted products are

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

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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. $ArCH_2CH_2N^{\oplus}R_3$

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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. $Ph-CH=CH-COOH$

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

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11. Give major products of the following:

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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.

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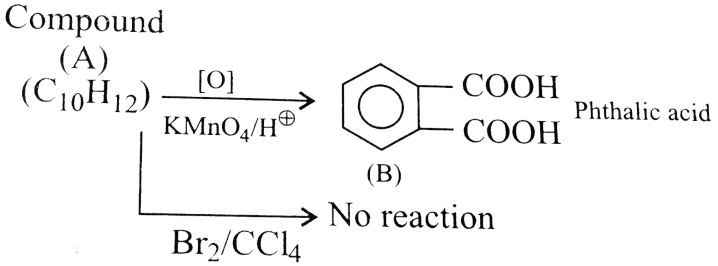
13.



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

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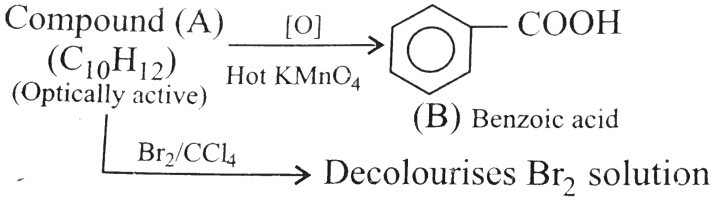
14. Identify (A).



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15. Give the products of the following:

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

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

iii. Benzene $+$ Ethylene oxide $+ AlCk_3$

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

$(B) \xleftarrow{C_6H_6 + AlCl_3|}$

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

$(D) \xleftarrow{C_6H_6 + AlCl_3|}$

vi. Benzene + Phosgene $(COCl_2) \xrightarrow{AlCl_3} (E)$

overset(H_(3)O^(o+))(rarr) (F)$vii.\ To\underline{e} \neq + Maloncianthydride$

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

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

$viii.\ Expla \in howalkylbenze \neq napha \leq \neq , anthrace \neq$ and $phenanth$

F.C.` reaction ?

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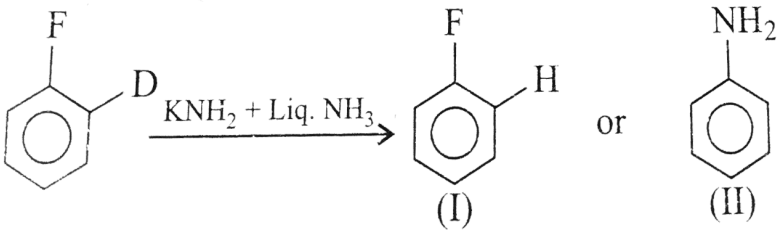
16. a. Show that reaction of $o-$ bromogluro benzene with Mg produces benzyene.

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

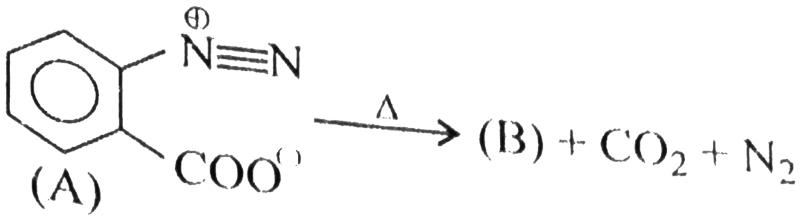
c. Why does bromobenzyene react faster than $2.6-$ dideuteriobromonbenzene with $NaNH_2$ in liw. NH_3?

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).



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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

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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 (C_4H_9Br)

ii. Isobutyl bromide Me_2CHCH_2Br

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

iv. tert- Butyl bromide Me_2C-Br

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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

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

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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

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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

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

i. $ClCH_2CH=CH_2$

ii. $CH_3CH_2CH_2Cl$

iii. $CH_3CH=CHCl$

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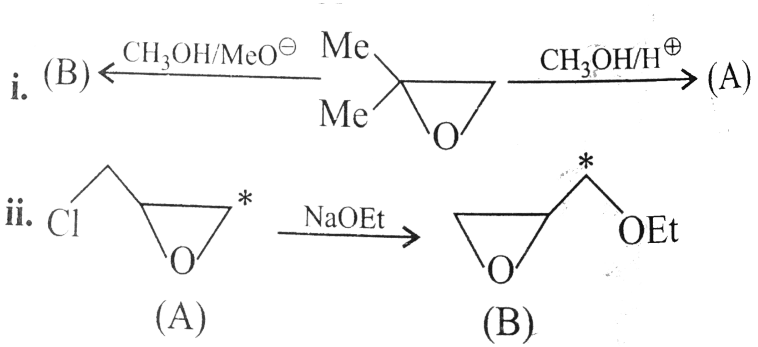
24.



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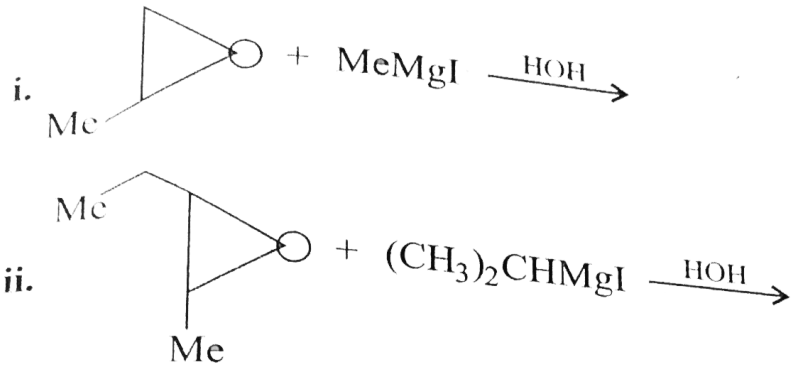

25.

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

a. $CH_3OC(CH_3)_3$

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

c. $CH_3CH_2CH_2N(CH_3)_2$

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. $CH_3CH_2 - O - N = 0$

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

$a.$ CH_3Br or CH_3I

b. $(CH_3)_3\mathbb{C}l$ or CH_3Cl

c. $CH_2 = CHBr$ or $CH_2 = CH - CH_2Br$

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28. Arrange the folliwing compounds in increasing order of SN^{-1} 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. $(CH_3)_3\mathbb{C}l$, II. $C_6H_5C(CH_3)_2Cl$

III. $(CH_3)_2CHCl$, IV. $CH_3CH_2CH_2Cl$

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29. Predict all the alkenes that would be formed by dehydrohalogenation of the following halides with sodium ethoxide in ethanol and identify the major alkene:

(i) 1-Bromo-1-methylcyclohexane , (ii) 2-Chloro-2-methylbutane

(iii) 2,2,3-Trimethyl-3-bromopentane

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

a,. I. $CH_3CH_2CH_2CH_2Cl$

II. $(CH_3)_2CHCH_2Cl$

III. $(CH_3)_2CH-CH_2Br$

IV. $CH_3CH(Br)CH_2CH_3$

V. $(CH_3)_3C-Br$

b. I. $CH_3CH(Br)CH_3$

II. $CH_3CH_2CH_2Br$

III. $(CH_3)_2CH-CH_2Br$

IV. $(CH_3)_3C-CH_2Br$

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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.

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

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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. $(CH_3)_2CHCl$

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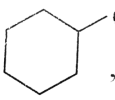
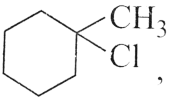
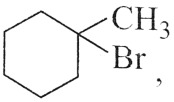
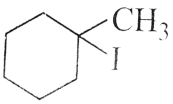
34. Predicrt the order of reactivity of the following compounds in SN^1 and SN^2 reactions.

I. 

II. 

III. 

IV. 

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35. Predict the order of reactivity of the following compounds in S_{n^1} and S_{N^2} reactions :

$C_6H_5CH_2Br, C_6H_5CH(C_6H_5)Br, C_6H_5CH(CH_3)Br$ and $C_6H_5C(CH_3)$

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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

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37.

Column-I	Column-II
(A) Maximum solubility in water	(P) F_2
(B) Corrosive liquid	(Q) Cl_2
(C) Maximum interatomic distance	(R) Br_2
(D) Maximum enthalpy of dissociation	(S) I_2

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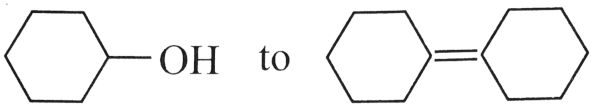
Exercises Subjective Type

1. Synthesise the following:

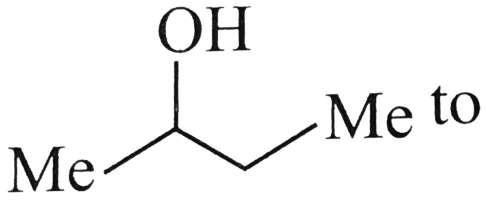
i. Propane to a. $1-$ fluroopropane, b. cyclopropane, and c. $2.3-$ dunethl

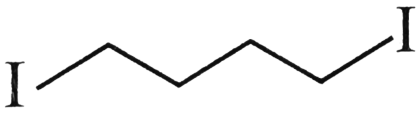
butane

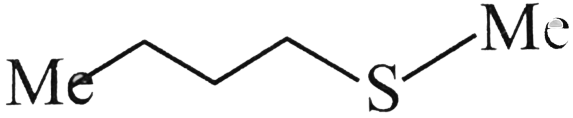
ii. 

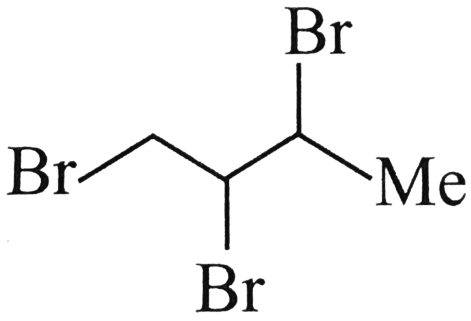
ii.

iii. C_2H_5Br to but $-1-$ ene

iv. 

a. 

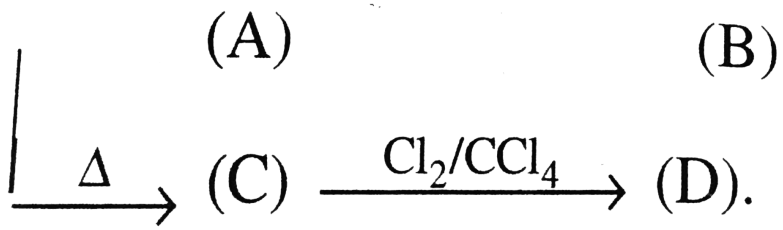
b. 

c. 

iv.

v. CYclopetane ro hexachloropentadience

(vi) Cyclopentadiene + Hexachlorocyclopentadiene



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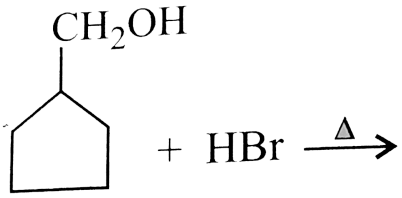
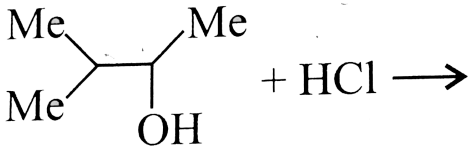
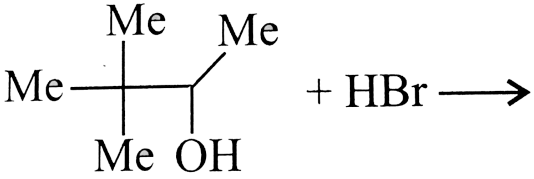
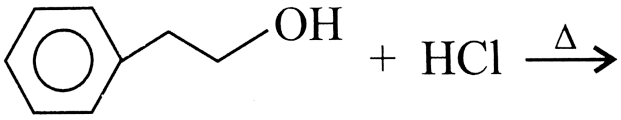
2. (i) Identify the major and minor products.

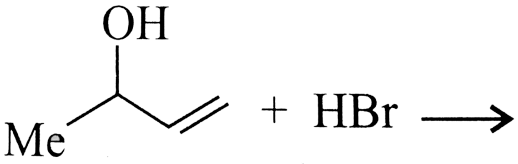
a. 

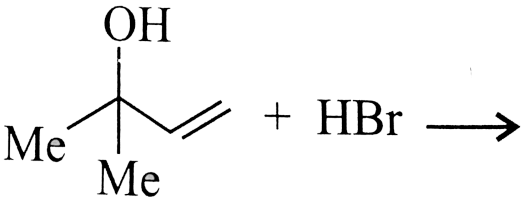
b. 

c. 

d. 

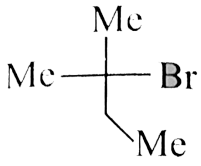
e. 

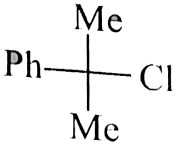
f. 

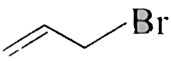
g. 

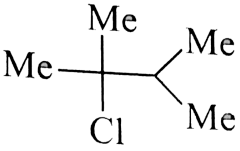
h1-$Bu\tan ol$+ HBr rarr$i$. 2-$Bu\tan ol$+ HBr rarr`

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:

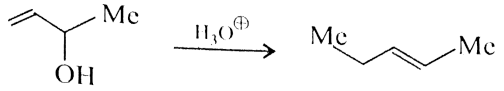
(##KSV_CHM_ORG_P2_C11_E01_003_Q06.png" width="80%">

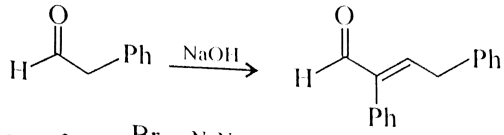
a. Br_2/Fe , b. $Br_2/\mathbb{C}l_4$

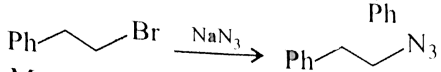
c. NBS , d. HBr

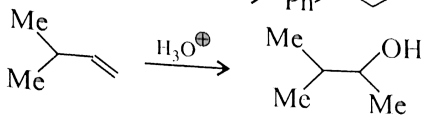
View Text Solution

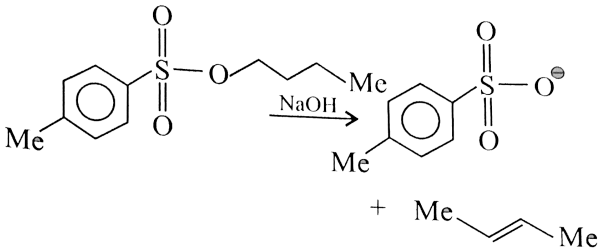
3. i. Classify the following reactions as an addition elimination substituation condensation rerrangement geometrical isomerisation, or oxidation/reduction.

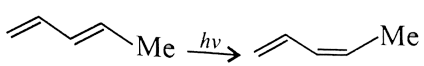
a. 

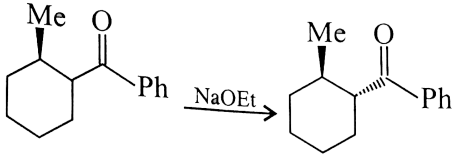
b. 

c. 

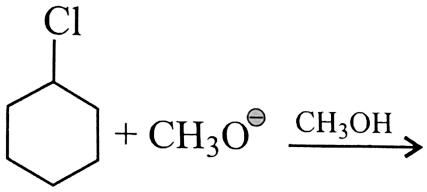
d. 

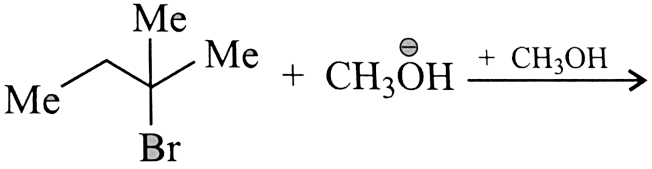
e. 

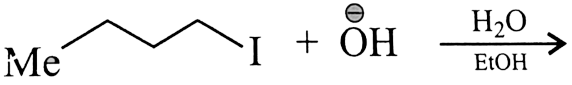
f. 

g. 

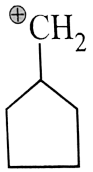
ii. Show both substition and elmination products in these reactions.

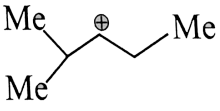
a. 

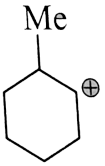
b. 

c. 

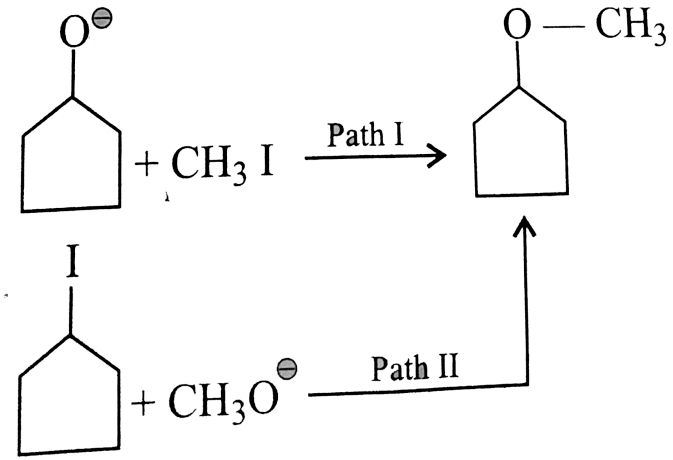
iii. SHow the rearranged carbocations that are expected form these carbocations.

a. 

b. 

c. 

iv. WHich path is better for the reaction ?



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

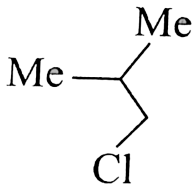
a. SN^2 , b. SN^(1)$c.$ SN^(1) and SN^(2) , $d.\ No \neq ii.\ Whichofthefollow \in gstatementsisc$ or $rect?$(A) overset(Aq. KOH)(larr) C_(2)H_(5) Br overset(Alc. KOH)(rarr) (B)$a.$ (A) $isobta \in edbye$ $\lim$ $\in ationreaction.\ b.$ (B) $isobta \in edby \subset stitutionreaction.\ c.$ (A)isC_(2) H_(6)$whi \leq$ (B)is

C_(2)H_(6)O. $d.$ (A)$isisomerof$ dim $enthyether$(B)

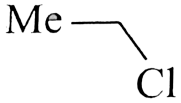
$isdehydratedcompoundof$(A). $iii.\ WHichofthefollow \in gwillundergo$

SN^(2)` readiluy?

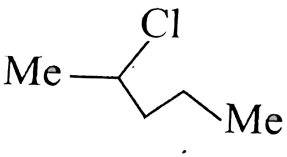
a.



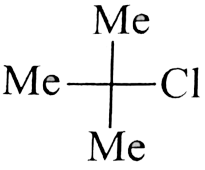
b.



c.

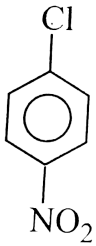


d.

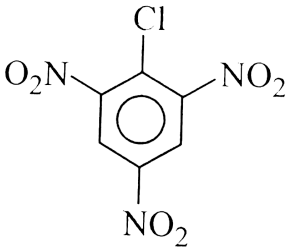


iv. Which of the following will undergo hydrolsis most readily with aq. KOH ?

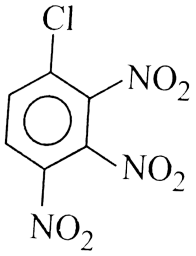
a.



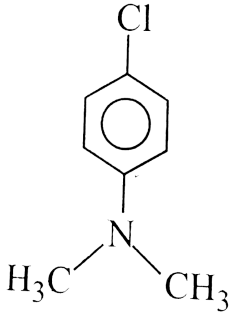
b.



c.

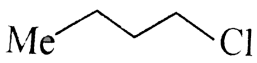


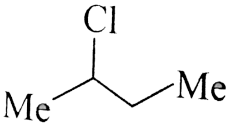
d.

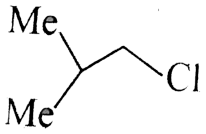


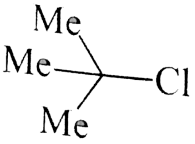
V. In tow experiments equal quantities of an alkyl halide, (C_4H_9Cl) were

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

a In C_2JHl the bond energy is decreased through resonace involving

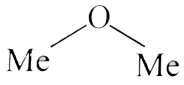
lone pair of $\bar{e}'s$ on chlorine.

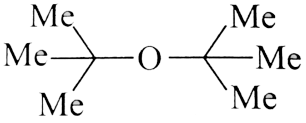
b. The hyperconjugation stabilsation in C_2H_5Cl.

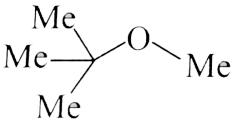
c. In vinyl chloride, $(C-Cl)$ bond gets partial double bond character through resonance.

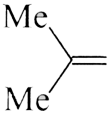
d. In vinyl chloride the Cl atom is attached to $sp-$ hybridised C, whereas in C_2H_5Cl it is attached to sp^3-hybridsed C atom.

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

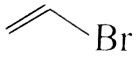
a. 

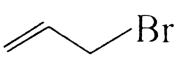
b. 

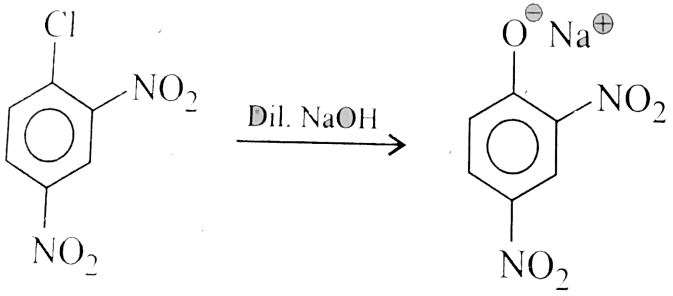
c. 

d. 

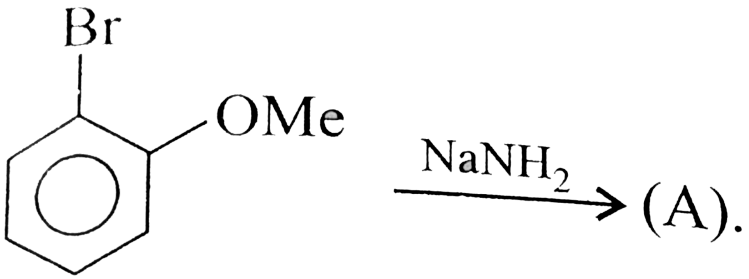
ix. Which of the following would be hydrolsed most readily?

c. 

d. 



x.



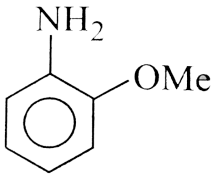
The above reaction proceeds rhrough:

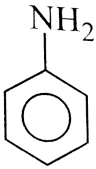
a. Electrophilic additon

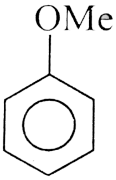
b. Benzyne intermediate

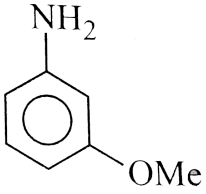
c. Activated nucleophilic substitution

d. Oxirane

a. 

b. 

c. 

d. 

xi.

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5. A white precipitate was formed slowly when silver nitrate was added to compound (A) with molecular formula $C_6H_{13}Cl$.Compound (A) on treatment with hot alcoholic potassium hydroxide gave a misture of two isomeric alkenes (B) and (C), havinig the formuls C_6H_{12}. The mixture of (B) and (C), on ozonolsis, furnished four compounds.

i. CH_3CHO,ii C_2H_5CHO

iii. CH_3COCH_3,(iv) $CH_3 - \underset{\underset{CH_3}{|}}{CH} - CHO$

What are the structures of (A),(B)and (C) ?

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Exercises Subjective

1. Give the chemical test to distinguish between

(a) Hexane , $MeCH = CHCl$,

Propylchloride , and $CH_2 = CHCH_2Cl$

(b) $CH_3Cl, CH_3Br,$ and CH_3I

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2. Give the structural formula of the following compounds:

5-Methyl-2-nitrophenol

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3. The ion that cannot undergo disproportionation is :

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4. Among the following ion the one that cannot undergo disproportionation

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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.

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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 $H_2/Pd(BaSO_4)$ gives compound (C) which on reaction with hydrazine gives a cyclised compound (D), $(C_{14}H_{10}N_2)$ Idenyify (A), (B), (C) and (D). Explain the formation of (D) from (C).

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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).

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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) ?

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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 monobasic acids. The acid form (X) on distillation with soda line gave benzene while those form (Y) and (Z) gave monochlorobenzene. What formula would you assign to the various compounds?

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10. The compound $C_8H_9Cl(A)$ on treatments with KCN followed by hydrolysis gives $C_9H_{10}O_2(B)$.Ammonium salt of B on dry distillation yields C.Which reacts with alkaline solution of bromine to gives $C_8H_{11}N$. (D),Another compound E $(C_6H_{10}O)$ is obtained by the action of nitrous acid on D. or by the action of aquouspotash on A,E on oxidation gives $F(C_8H_{10}O)$ Which gives the inner anhydride G on heating.

The compound D is reaction with $CHCl_3 + NaOH$ gives a compound H.The structure of H.

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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 $(E)(C_7H_6O_4)$ which may be decarboxylated to form $C_6H_6O_2(F)$. Identigy compounds (A) to (F).

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12. The compoiund A 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).

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13. Compound $(A)(C_8H_{12})$ on oxidation gives an acid $B(C_4H_6O_2)$. One mole of compound (A) reacts with $3mol$ of H_2 in the presence of Pt catalyst to give octane. Identify compound (A).

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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.

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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).

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16. When boromobenze is monochlorinated. Two isomeric 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.

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17. $0.450gm$ of an aromatic organic compound (A) on ignitin gives $0.905gmCO_2$ and $0.15gmH_2O$. $0.350gm$ of (A) on boiling with HNO_(3) and adding AgCl. The vapour density of (A) is 87.5. 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.

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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. $1,4-$ Dibromobutane $(0.1mol)$ is treated with sodium sulphide $(0.1mol)$ in aqueous ethanol.

b. $1-$ Choloro -2 $(2-$ hydroxyphenyl) ethane is treated with aqueous sodium hydroxide.

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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_(3)CH_(2)CH = CH_(2) + HBr overset("Peroxide")

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Exercises Concept Application

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

a. Propene to $1-$ Nitropropane

b. Bromocethane to cis-hex $-3-$ ene

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2. A sample of $0.246gm$ of an organic compound gave $0.198gm$ fo CO_2 and $0.104gm$ of H_2O on complete combusion. $0.37gm$ 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.

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3. a. Benzene to $4-$ bromo nitro benzene

b. Toulene to benzyl alchohol

c. $I-$ Bromopropane to $2-$ bromobnpropane

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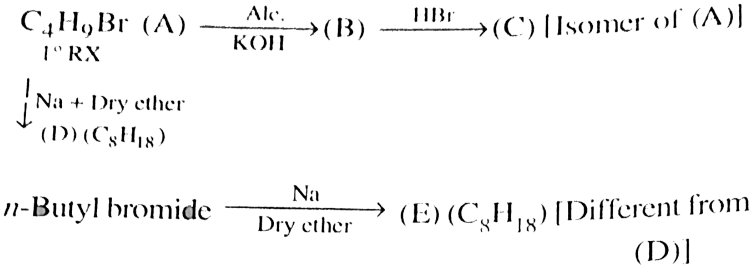
4. Identify (A) to (E):



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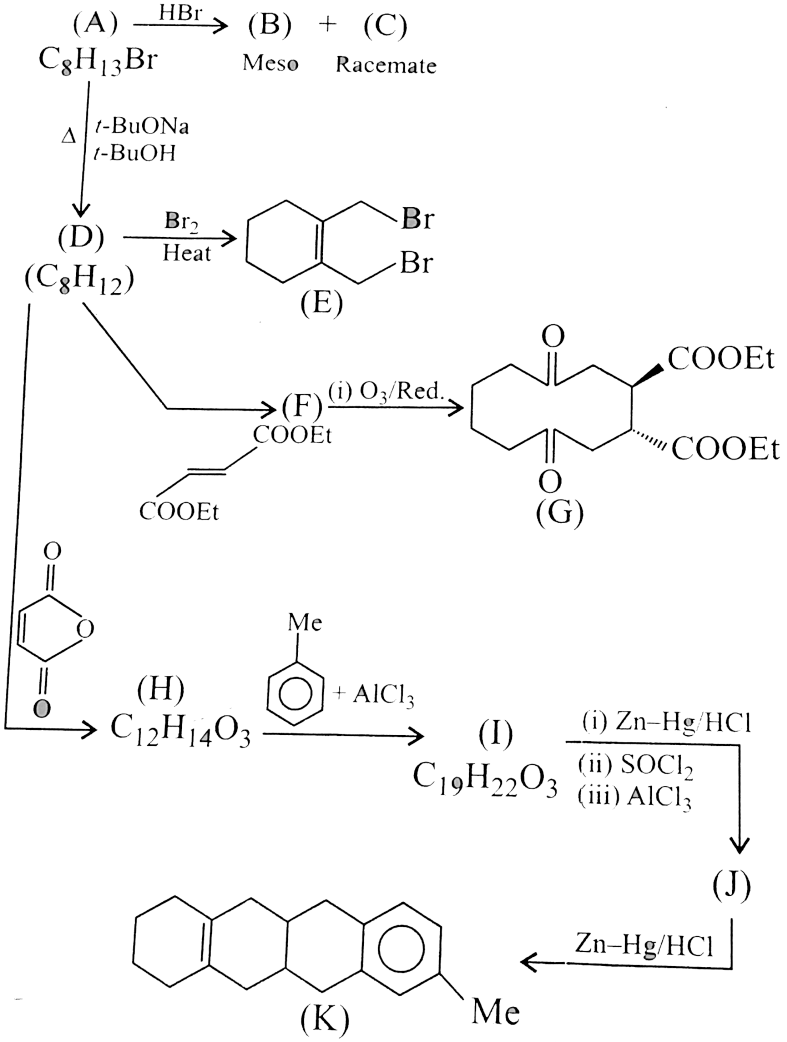
Exercises Linked Compreshension

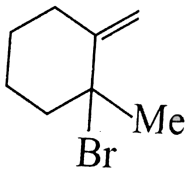
1. This section contains 11 pragraphs, Based on each paragraph, four to nine mutilple choice questions have to be answered. Each question has four mutiple chaoices questions have to be answered. Each question has four mutiple choices (a), (b), (c) and (d) out of which only one is correct or wrong.

Paragraph for Problems $1-8$

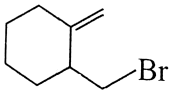


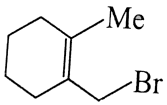
Compound (A) is:

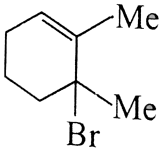
a.



A.

B. b. 

C. c. 

D. d. 

Answer: a

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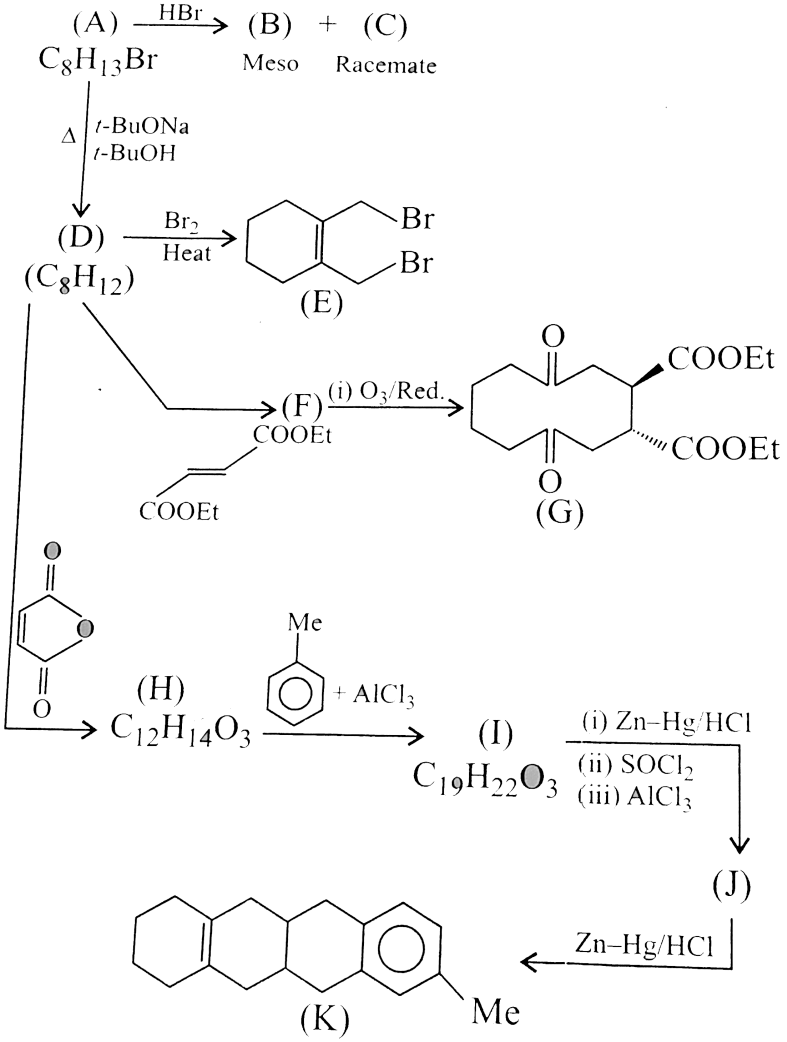
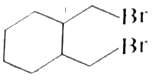
2. This section contains 11 pragraphs, Based on each paragraph, four to nine mutilple choice questions have to be answered. Each question has four mutiple chaoices questions have to be answered. Each question has four mutiple choices (a), (b), (c) and (d) out of which only one is correct or wrong.

Paragraph for Problems $1 - 8$

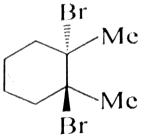


Compound (B) is:

A. a.

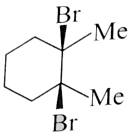


B. b.



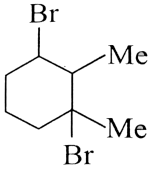
C.

c.



D.

d.



Answer: c

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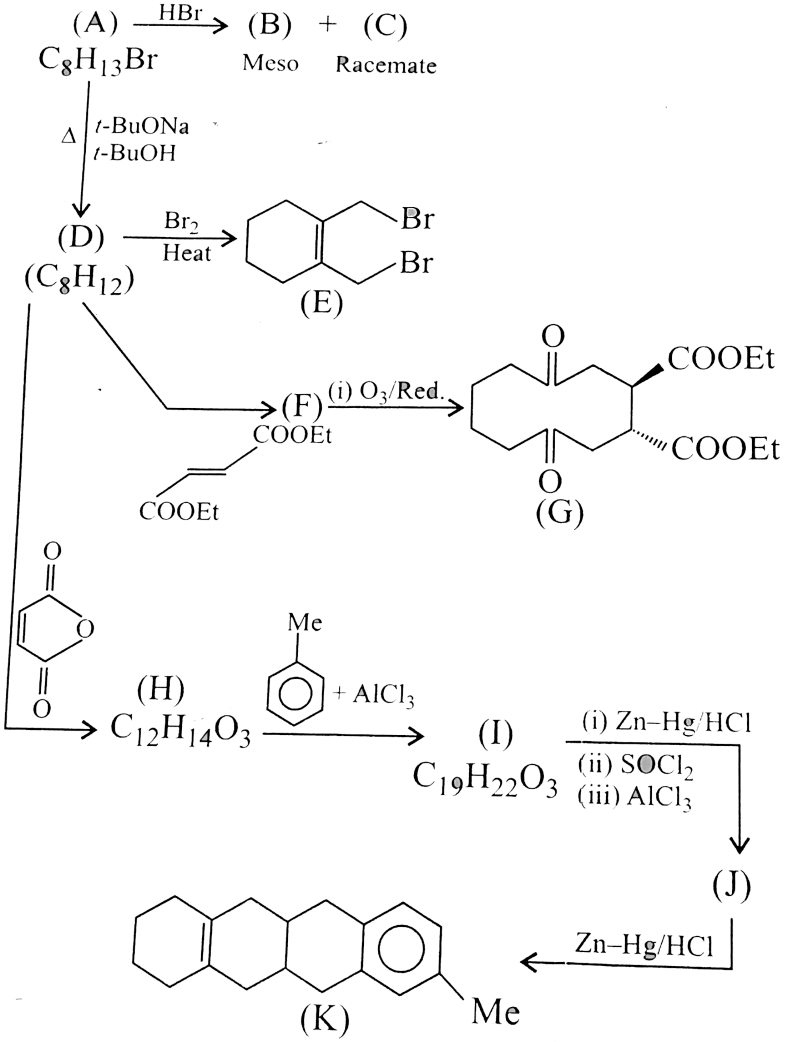
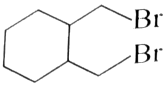
3. This section contains 11 pragraphs, Based on each paragraph, four to nine mutilple choice questions have to be answered. Each question has four mutiple chaoices questions have to be answered. Each question has four mutiple choices (a), (b), (c) and (d) out of which only one is correct or wrong.

Paragraph for Problems $1-8$



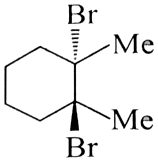
Compound (C) is:

a. 

A.

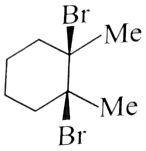
B.

b.



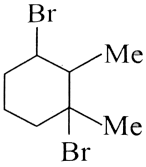
C.

c.



D.

d.



Answer: b

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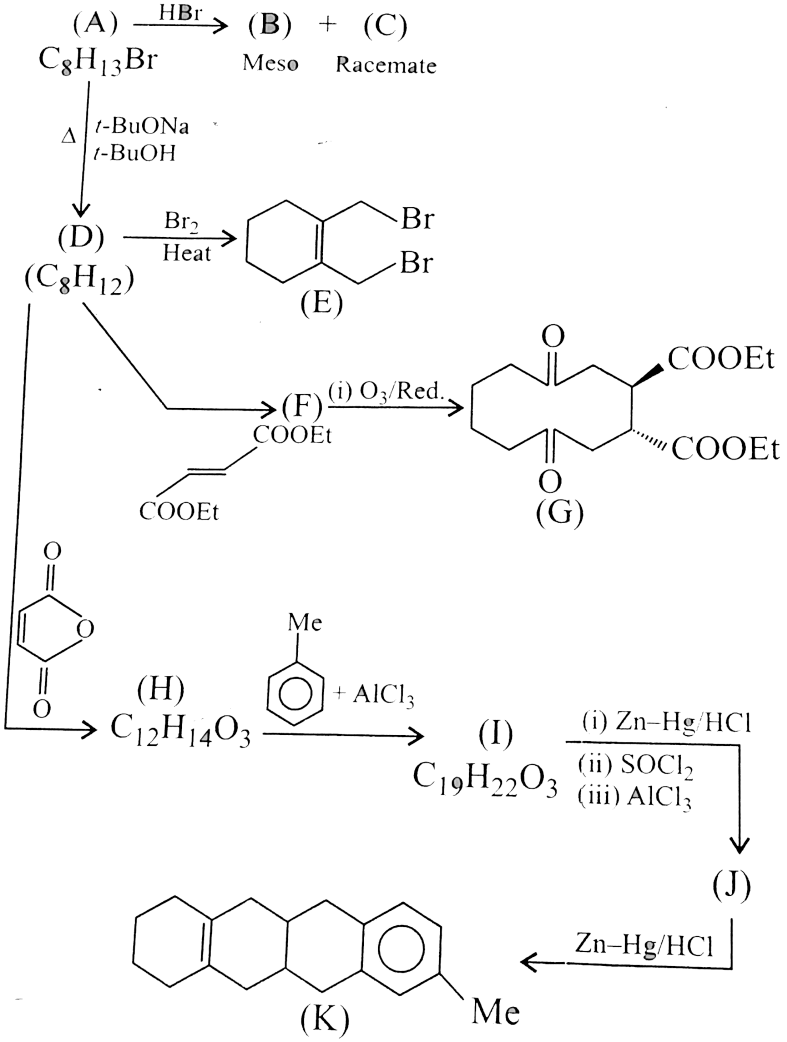
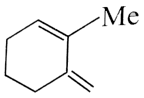
4. This section contains 11 pragraphs, Based on each paragraph, four to nine mutilple choice questions have to be answered. Each question has four mutiple chaoices questions have to be answered. Each question has four mutiple choices (a), (b), (c) and (d) out of which only one is correct or wrong.

Paragraph for Problems $1-8$

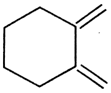


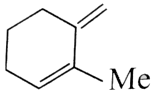
Compound (D) is:

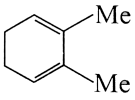
A. **a.**



B. **b.**



C. **c.** 

D. **d.** 

Answer: b

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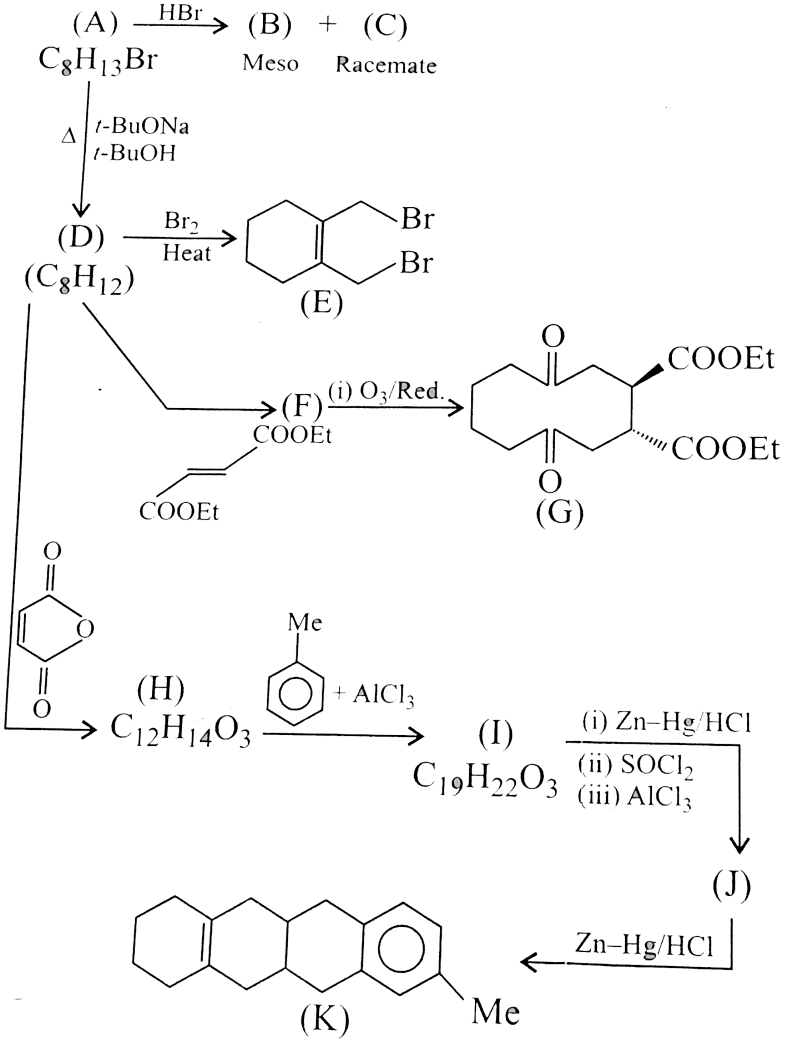
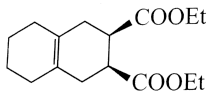
5. This section contains 11 pragraphs, Based on each paragraph, four to nine mutilple choice questions have to be answered. Each question has four mutiple chaoices questions have to be answered. Each question has four mutiple choices (a), (b), (c) and (d) out of which only one is correct or wrong.

Paragraph for Problems $1-8$

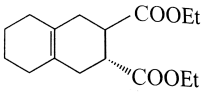


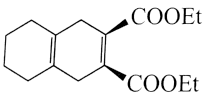
Compound (F) is:

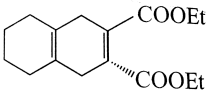
A. a.



B. b.



C. c. 

D. d. 

Answer: b

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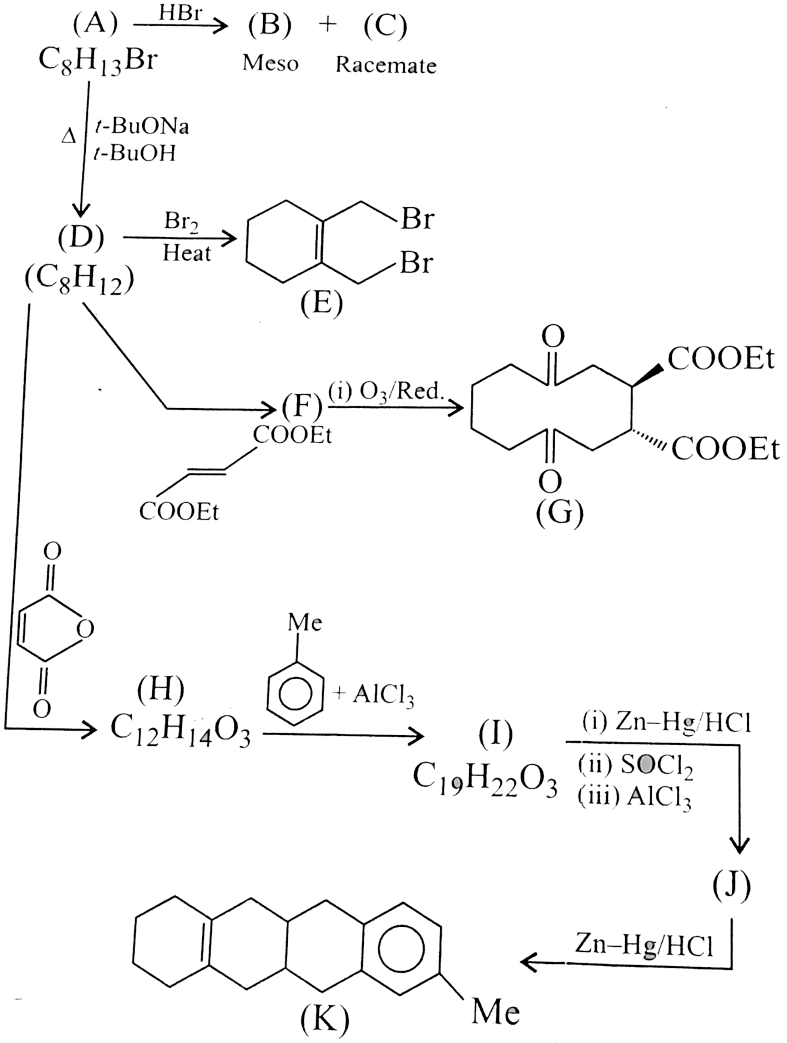
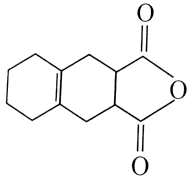
6. This section contains 11 pragraphs, Based on each paragraph, four to nine mutilple choice questions have to be answered. Each question has four mutiple chaoices questions have to be answered. Each question has four mutiple choices (a), (b), (c) and (d) out of which only one is correct or wrong.

Paragraph for Problems $1-8$



Compound (H) is:

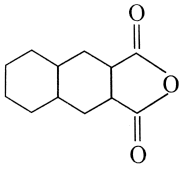
a.



A.

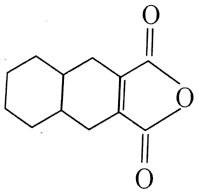
B.

b.



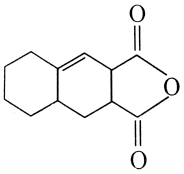
C.

c.



D.

d.



Answer: a

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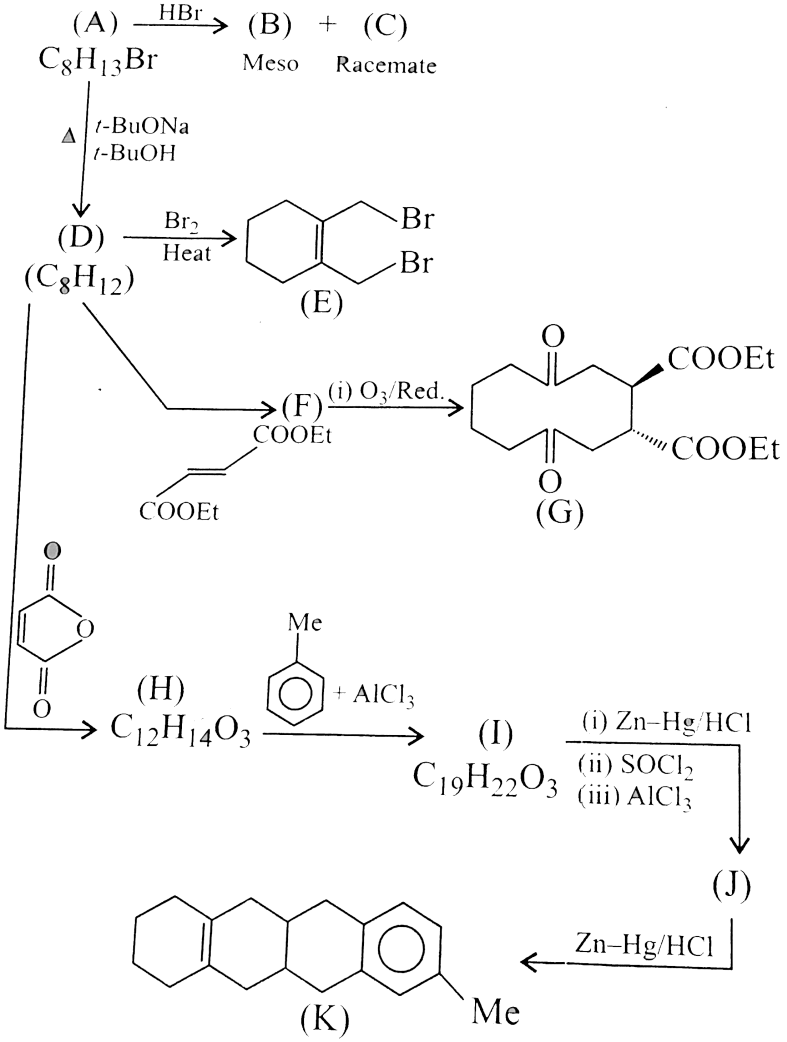
7. This section contains 11 pragraphs, Based on each paragraph, four to nine mutilple choice questions have to be answered. Each question has four mutiple chaoices questions have to be answered. Each question has four mutiple choices (a), (b), (c) and (d) out of which only one is correct or wrong.

Paragraph for Problems $1-8$

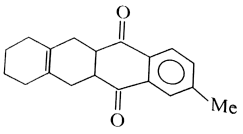


Compound (I) is:

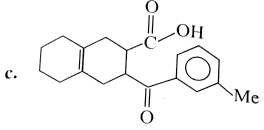
A.

b.

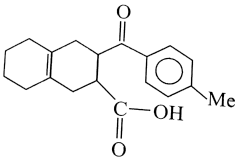
B.



C.



D.



Answer: d

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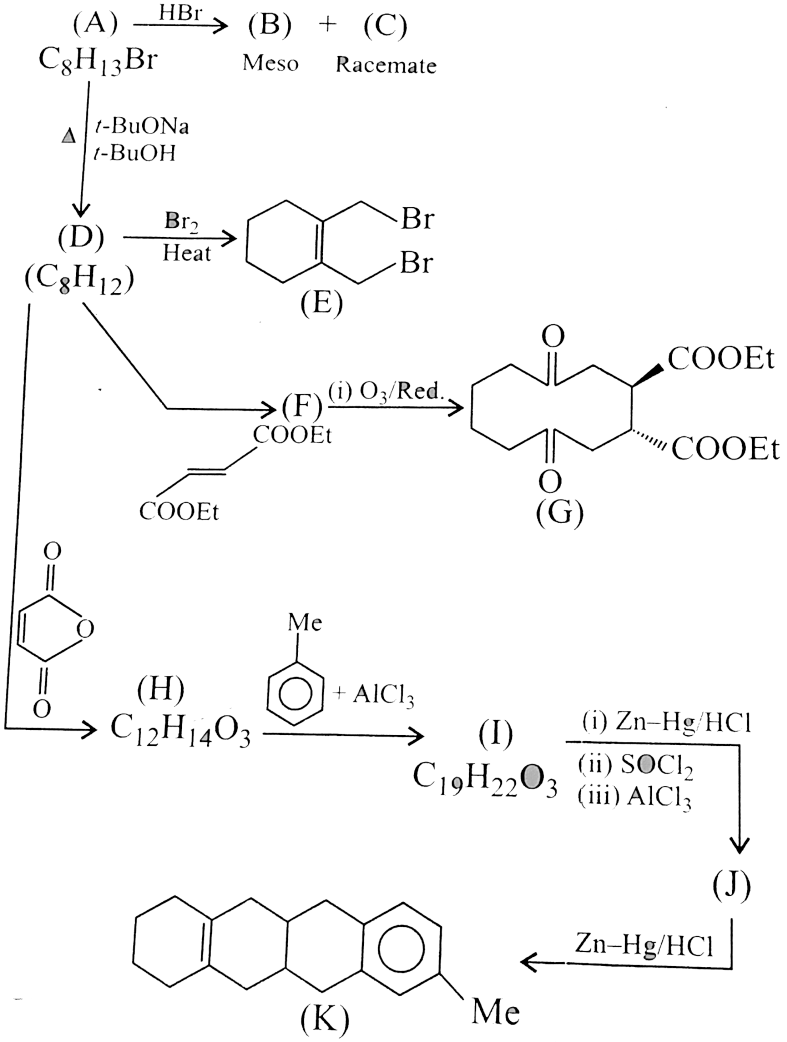
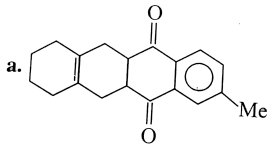
8. This section contains 11 pragraphs, Based on each paragraph, four to nine mutilple choice questions have to be answered. Each question has four mutiple chaoices questions have to be answered. Each question has four mutiple choices (a), (b), (c) and (d) out of which only one is correct or wrong.

Paragraph for Problems $1-8$

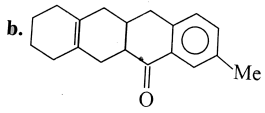


Compound (J) is:

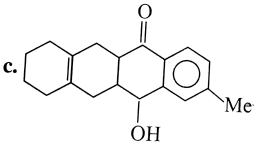
A.



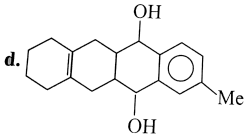
B.



C.



D.



Answer: b

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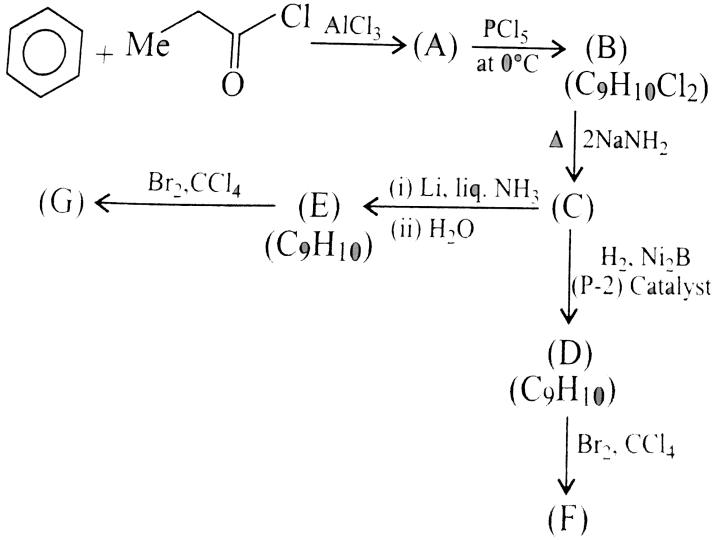
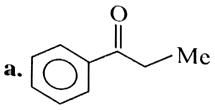
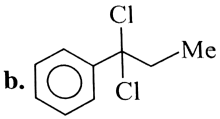
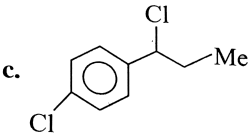
9. Paragraph for problems $9 - 15$

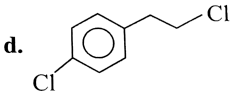


Compound (A) on reaction with $NH_2NH_2 + \overset{o-}{O}H$ is:

A. 

B. 

C. 

D. 

Answer: c

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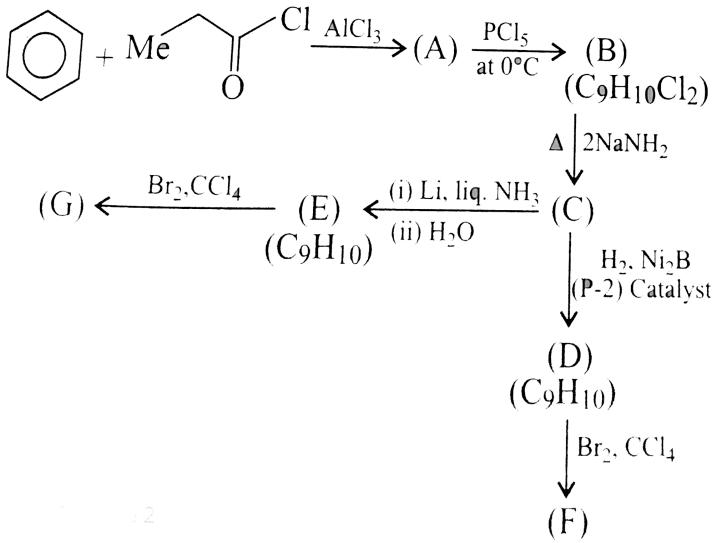
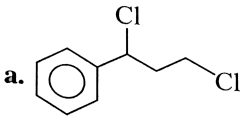
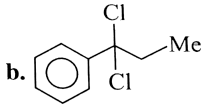
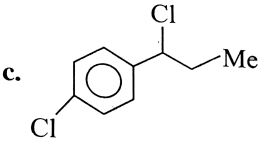
10. Paragraph for problems $9 - 15$



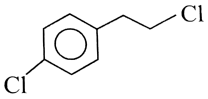
Compound (B) is:

A. 

B. 

C. 

d.



D.

Answer: b

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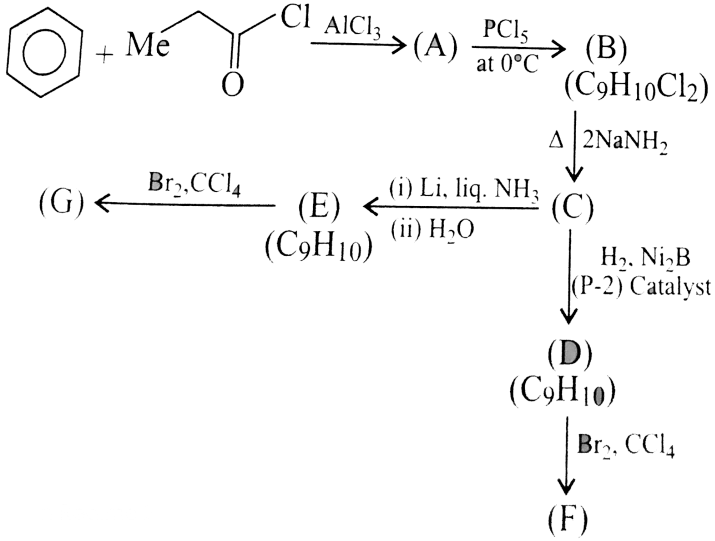
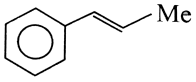
11. Paragraph for problems $9 - 15$

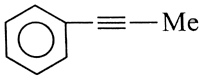


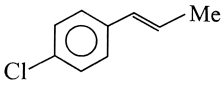
Compound (C) is:

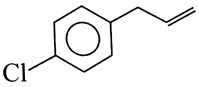
a.



A.

B. b. 

C. c. 

D. d. 

Answer: b

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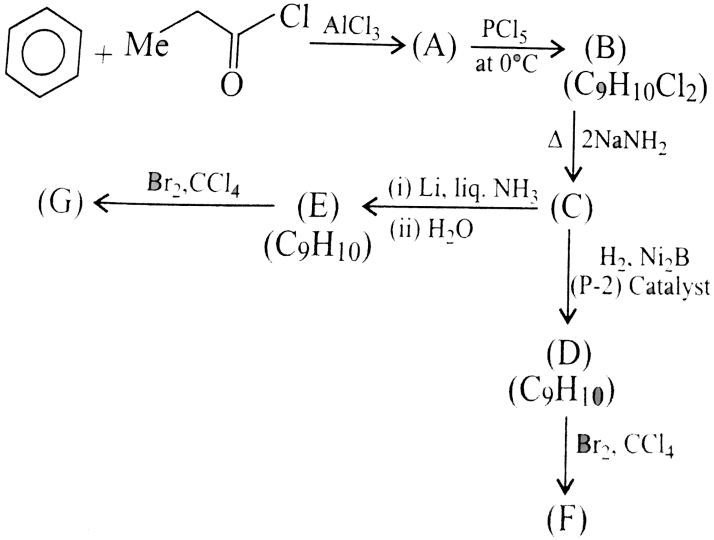
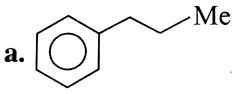
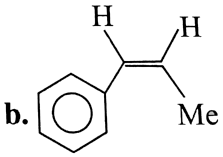
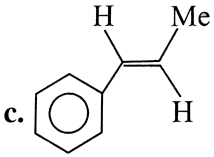
12. Paragraph for problems $9-15$

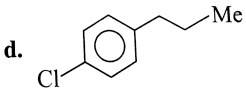


Compound (D) is:

A. 

B. 

C. 

D. 

Answer: b

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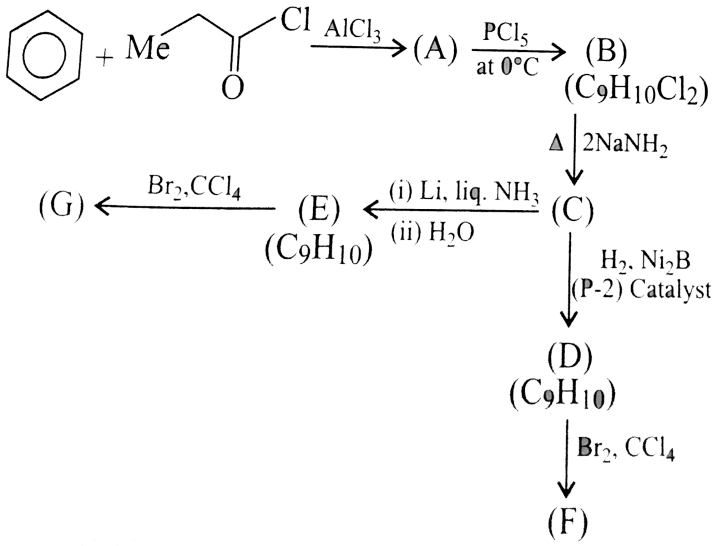
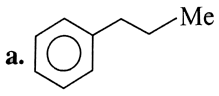
13. Paragraph for problems $9 - 15$

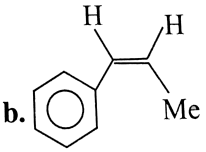


Compound (E) is:

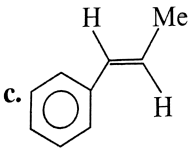
A.

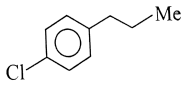


B.



C.



D. d. 

Answer: c

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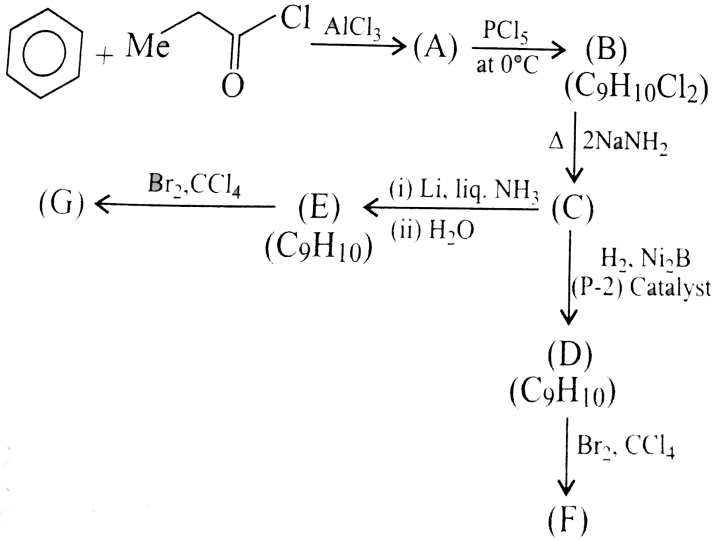
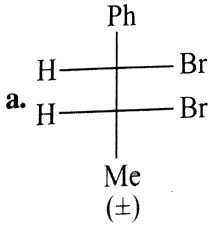
14. Paragraph for problems $9 - 15$

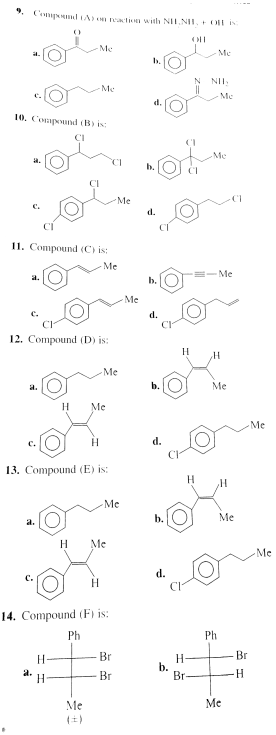


Compound (F) is:

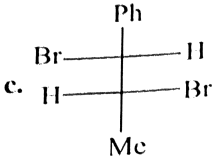
A.



B.



C.



D.

Answer: d

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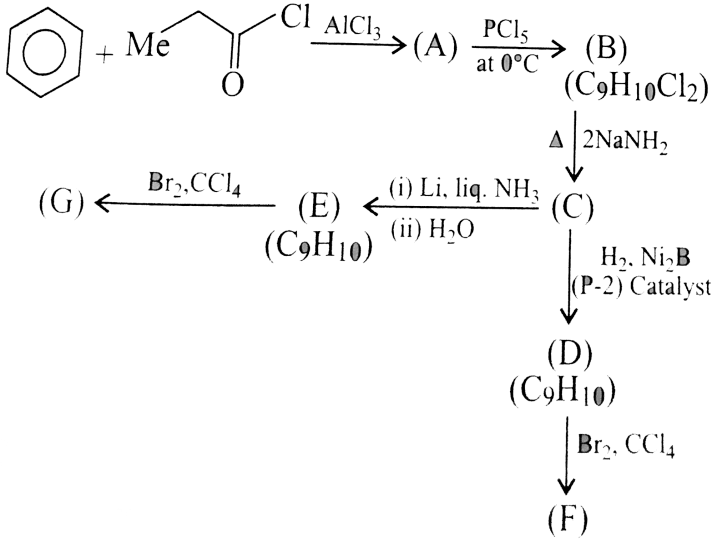
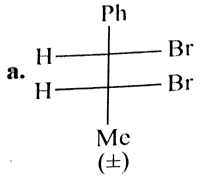
15. Paragraph for problems $9 - 15$

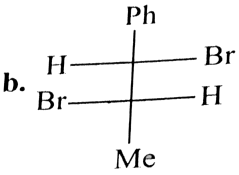


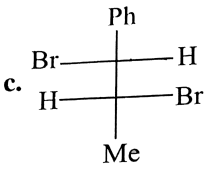
Compound (G) is:

A.



B.





C.

D. Both (b) and (c)

Answer: a

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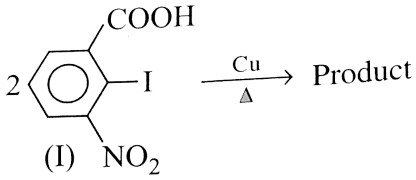
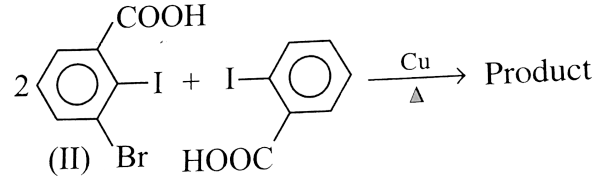
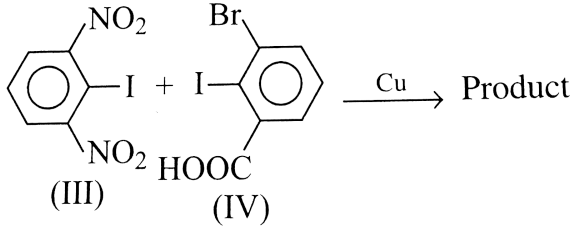
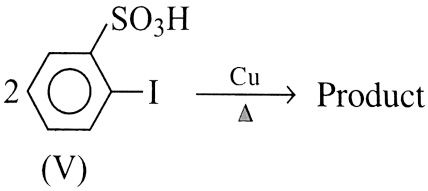
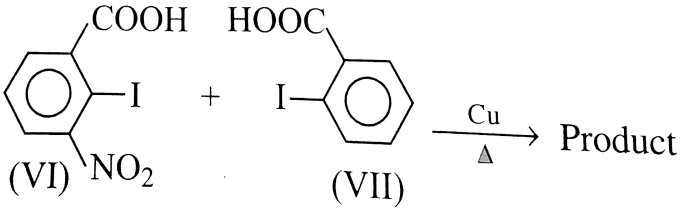
i. 

ii. 

iii. 

iv. 

v. 

16.

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

A. Wurtz reaction

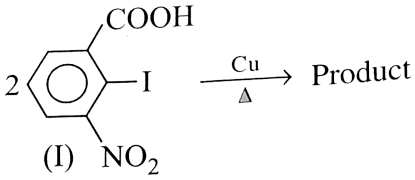
B. Wurtz-Fitting reaction

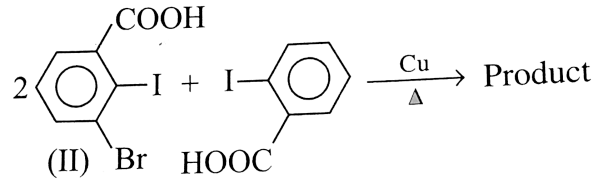
C. Ullmann reaction

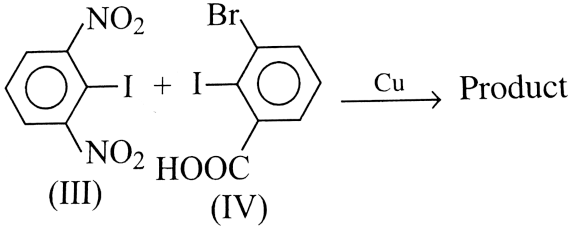
D. Frankland reaction

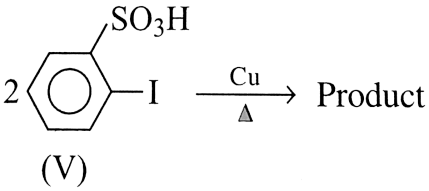
Answer: c

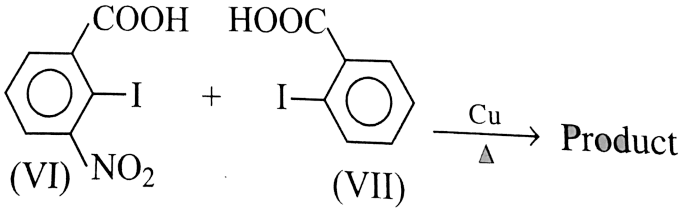
View Text Solution

i. 

ii. 

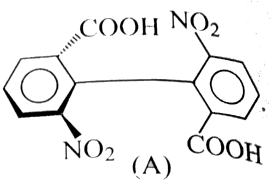
iii. 

iv. 

v. 

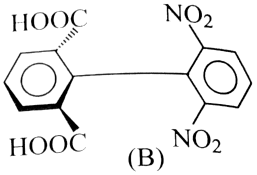
17.

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

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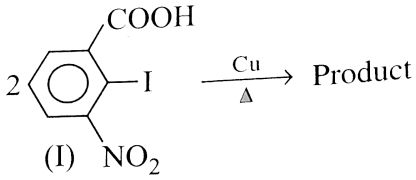
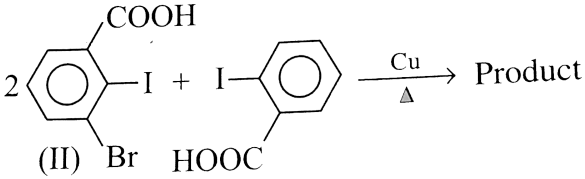
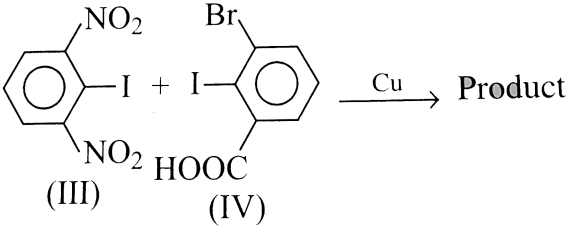
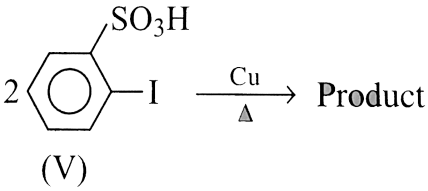
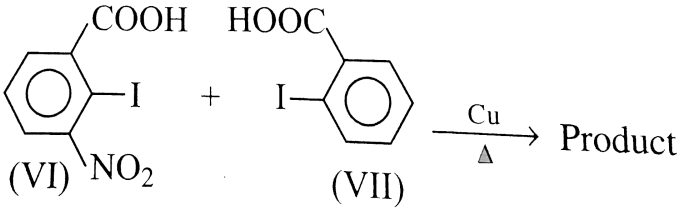
i. 

ii. 

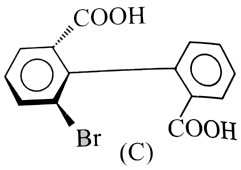
iii. 

iv. 

v. 

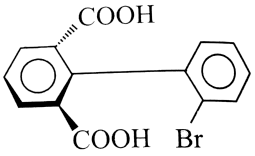
18.

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

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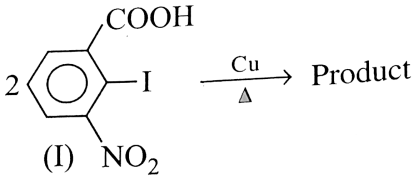
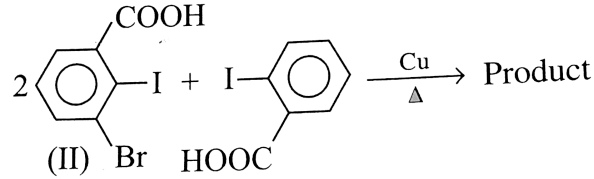
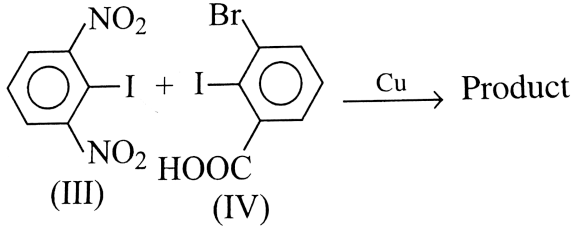
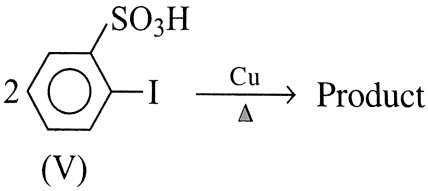
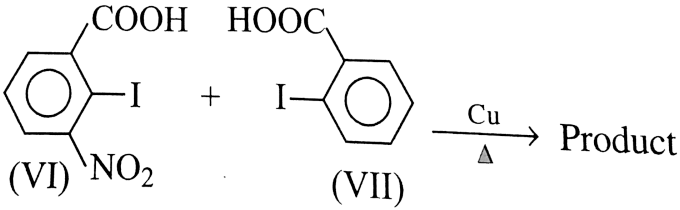
i. 

ii. 

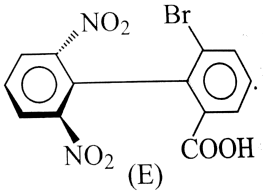
iii. 

iv. 

v. 

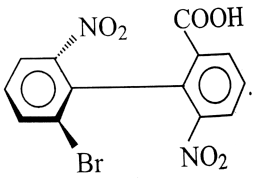
19.

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



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

B. Non-resolvable from of (E)



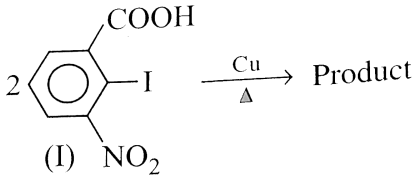
(F)

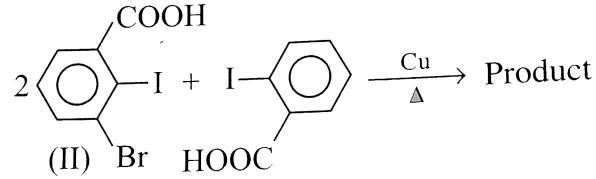
C. Resolvable $(+)$ and $(-)$ fomrs of

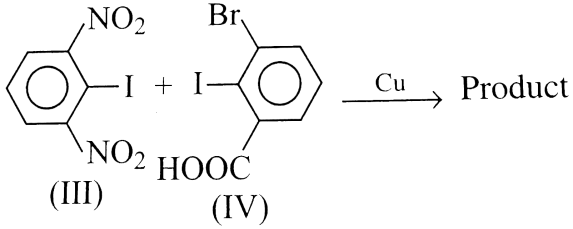
D. Non-resolvable form to (F).

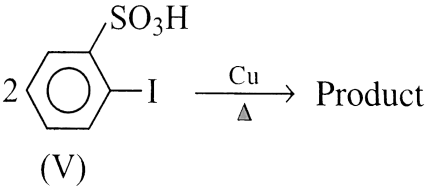
Answer: b

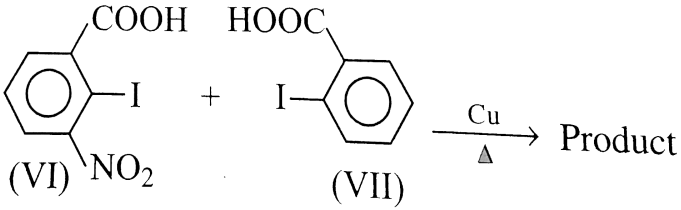
View Text Solution

i. 

ii. 

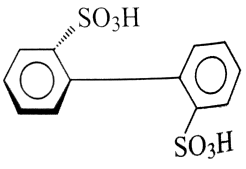
iii. 

iv. 

v. 

20.

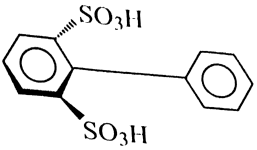
The compound(s) in the reaction (iv) is/are:



(G)

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

B. Non-resolvable from of (G)



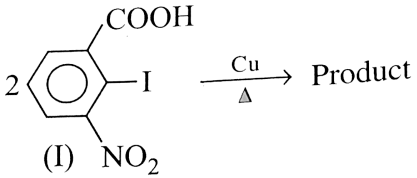
(H)

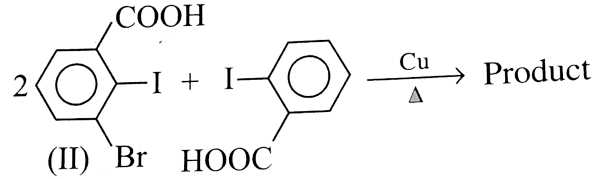
C. Resolvable $(+)$ and $(-)$ fomrs of

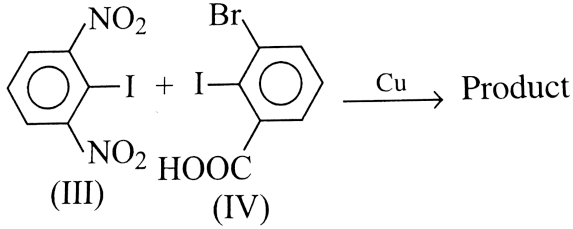
D. Non-resolvable form to (H).

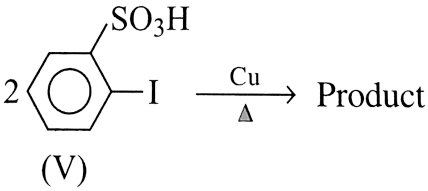
Answer: a

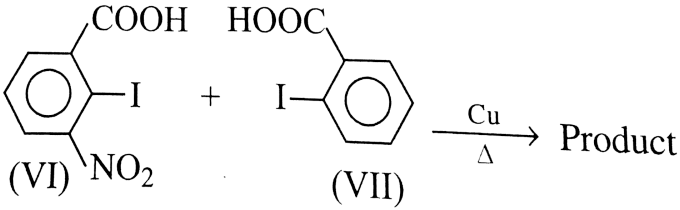
View Text Solution

i. 

ii. 

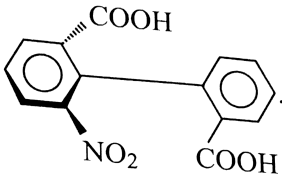
iii. 

iv. 

v. 

21.

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

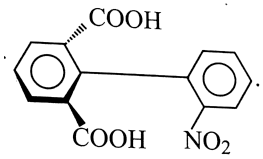


(I)

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

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22. A compound (A) with molecular formula C_5H_{10} gives one monochlorination product. Compound (A) is:

A. 5

B. 6

C. 7

D. 8

Answer: c

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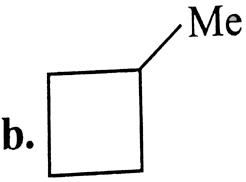
23. Compound (A), an alkene with molecule formula (C_5H_{10}) exists in various strictures. On mononcholorination and dichlorination, it again shows various structures and streoisomers.

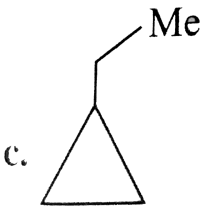
Which isomer of (A) shows styereoisomerism ?

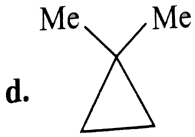
A.

B.



C.





D.

Answer: a

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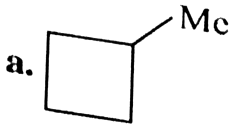
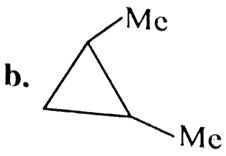
24. Compound (A), an alkene with molecule formula (C_5H_{10}) exists in various strictures. On mononcholorination and dichlorination, it again shows various structures and streoisomers.

Which isomer of (A) shows styereoisomerism ?

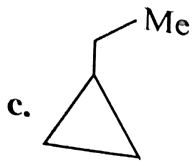


A.

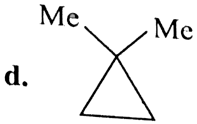


B.

C.



D.



Answer: d

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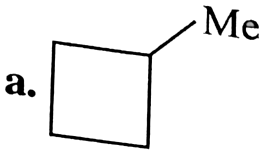
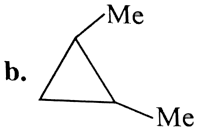
25. Compound (A), an alkene with molecule formula (C_5H_{10}) exists in various strictures. On mononcholorination and dichlorination, it again shows various structures and streoisomers.

Which isomer of (A) shows styereoisomerism ?

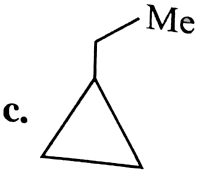
A.



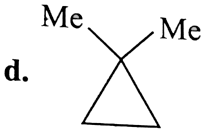
B.



C.



D.



Answer: b

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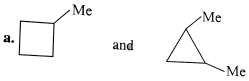
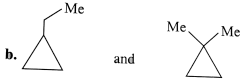
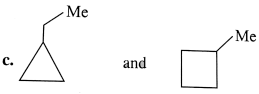
26. Compound (A), an alkene with molecule formula (C_5H_{10}) exists in various strictures. On mononcholorination and dichlorination, it again shows various structures and streoisomers.

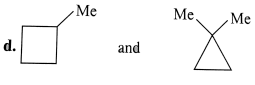
Which isomer of (A) shows styereoisomerism ?

A.



B. 

C. 

D. 

Answer: c

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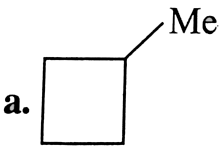
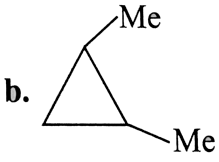
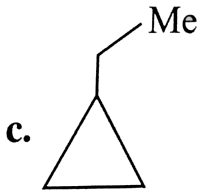
27. Compound (A), an alkene with molecule formula (C_5H_{10}) exists in various strictures. On mononcholorination and dichlorination, it again shows various structures and streoisomers.

Which isomer of (A) shows styereoisomerism ?

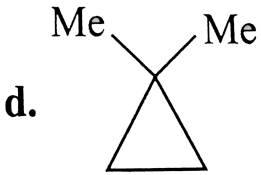
A. 

B. 

C.



D.



Answer: b

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

Which isomer of (A) shows styereoisomerism ?

A. 2

B. 3

C. 4

D. 5

Answer: b

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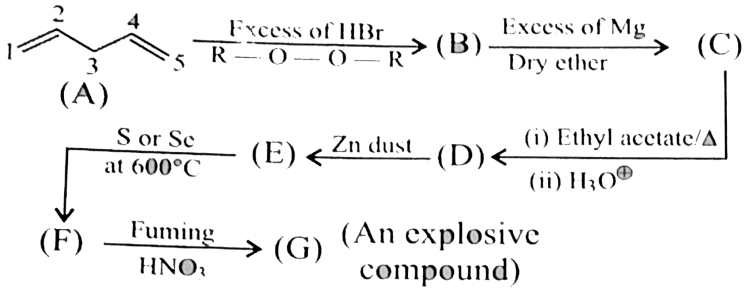
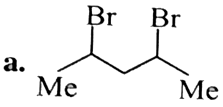
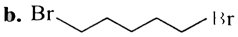
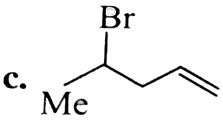


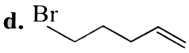
29.

Compound (B) is:

A. 

B. 

C. 

d. 

D.

Answer: b

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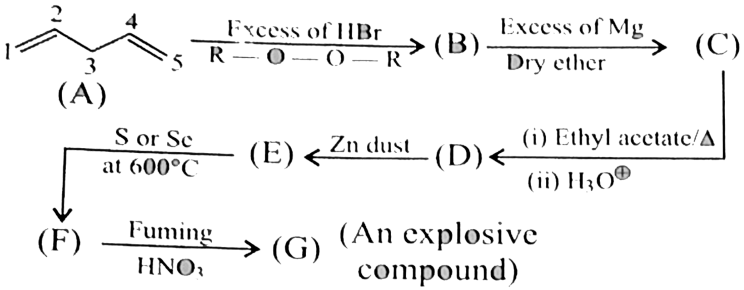
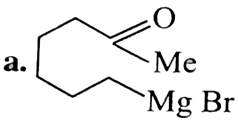
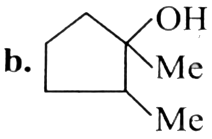


30.

Compound (D) is:

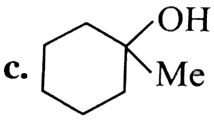
a. 

A.

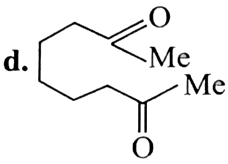
b. 

B.

C.



D.



Answer: c

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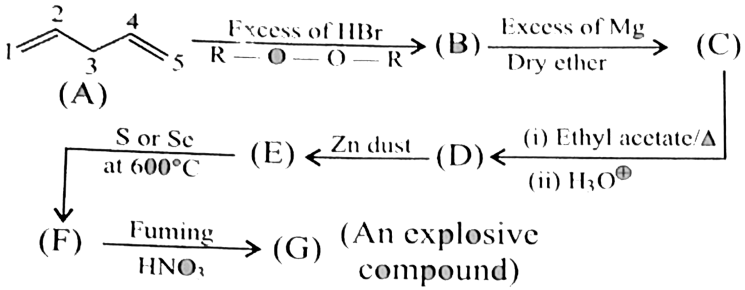
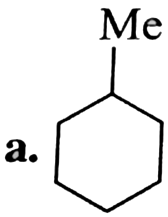
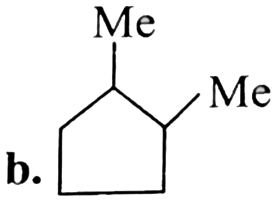
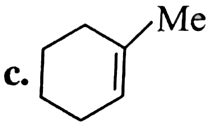
31.

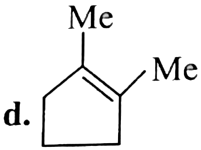


Compound (E) is:

A. 

B. 

C. 

D. 

Answer: a

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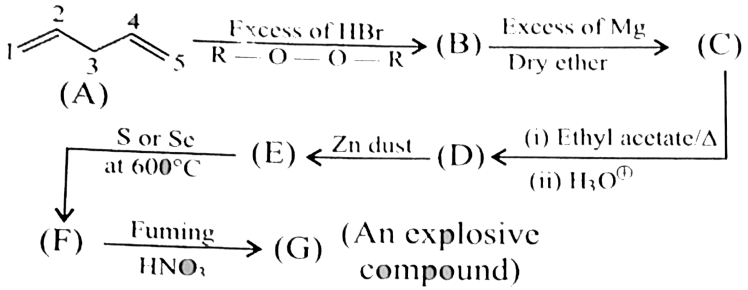
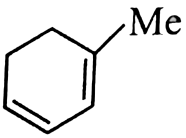


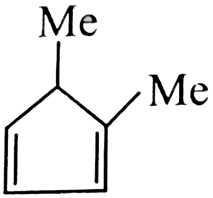
32.

Compound (F) is:

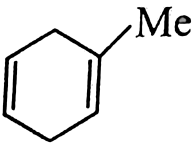
A. **a.**



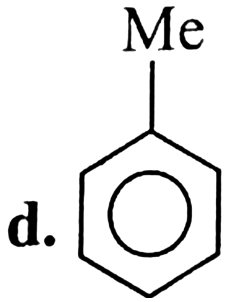
B. **b.**



C. **c.**



D.



Answer: d

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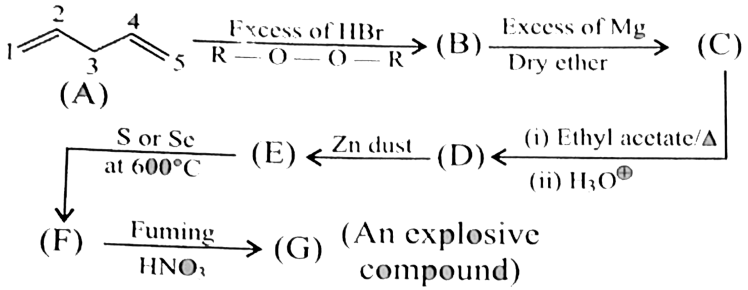
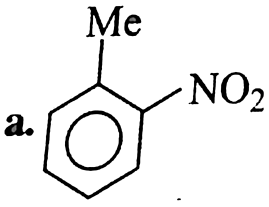
33.

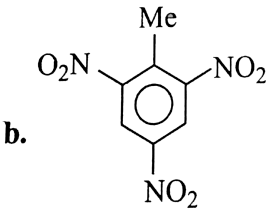


Compound (G) is:

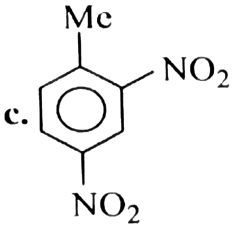
A.



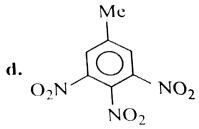
B.



C.



D.



Answer: b

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34. A hydrocation $(A)(C_8H_{10})(E)$ 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

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35. A hydrocation $(A)(C_8H_{10})(E)$ 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

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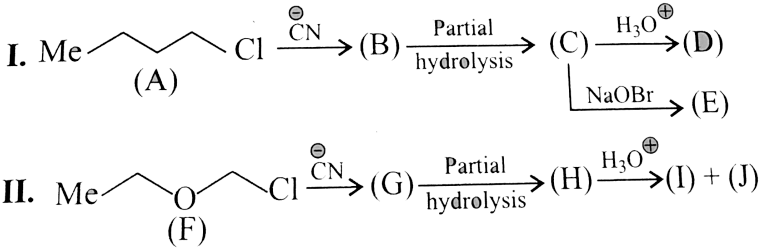
36.



Compound (B) is:

A. $n - BU - C \equiv N$

B. $n - Bu - \overset{\oplus}{N} \equiv \overset{o-}{C}$

C. Both

D. None

Answer: a

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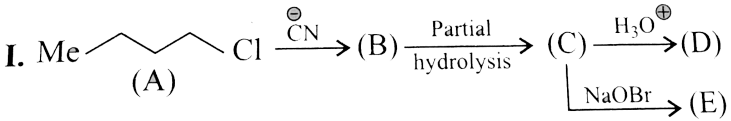
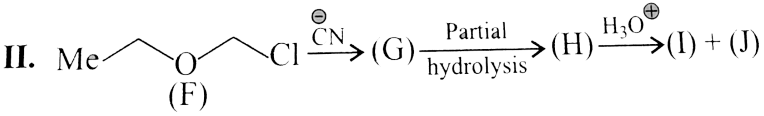
37.

I. 

II. 

Compound (C) is:

A. `Bu-COOH

B. $Bu - NH - CHO$

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

D. $Bu - NH_2$

Answer: c

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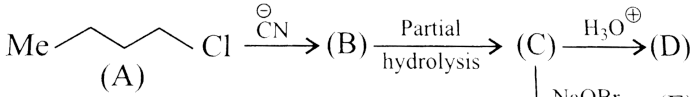
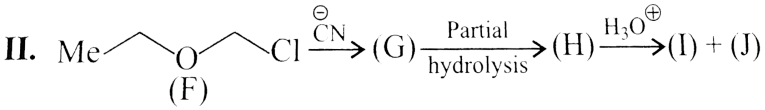
I. 

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

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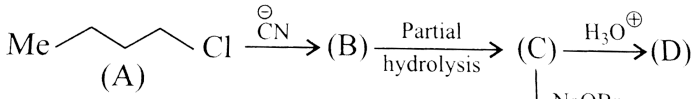
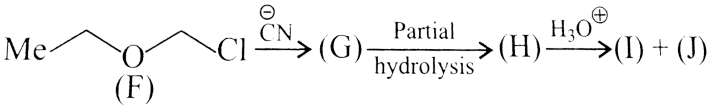
I. 

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

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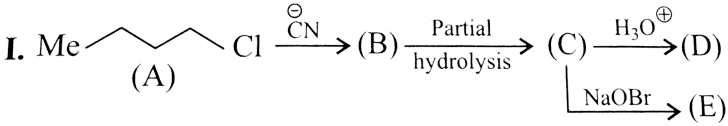
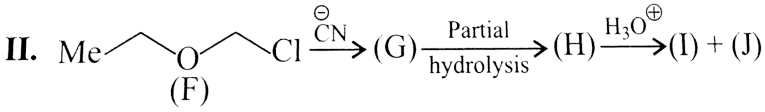
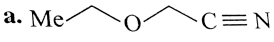
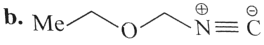
I. 

II. 

40.

Compound (G) is:

A. **a.** 

B. **b.** 

C. Both

D. None

Answer: b

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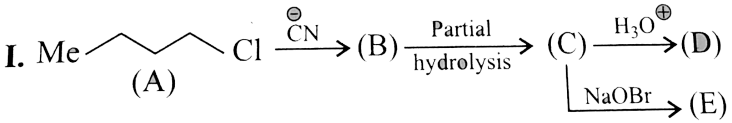
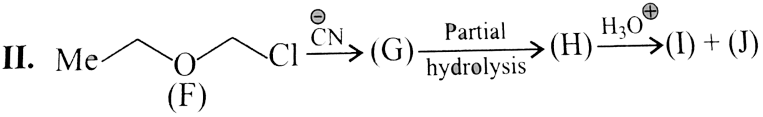
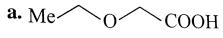
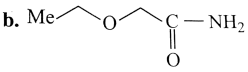
I. 

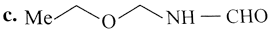
II. 

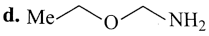
41.

Compound (H) is:

A. 

B. 

C. 

D. 

Answer: c

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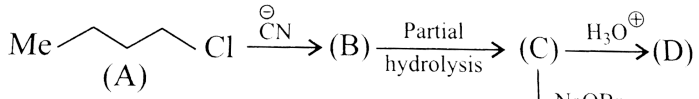
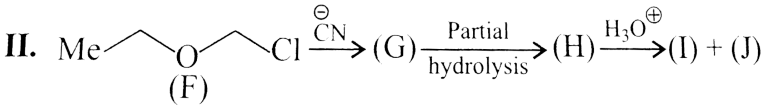
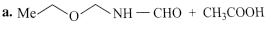
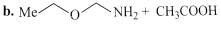
I. 

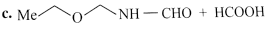
II. 

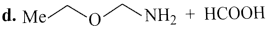
42.

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

A. a. 

B. b. 

C. c. 

D. d. 

Answer: d

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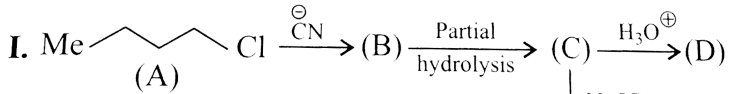

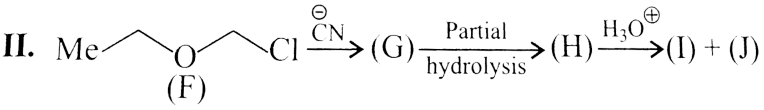

43.

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

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

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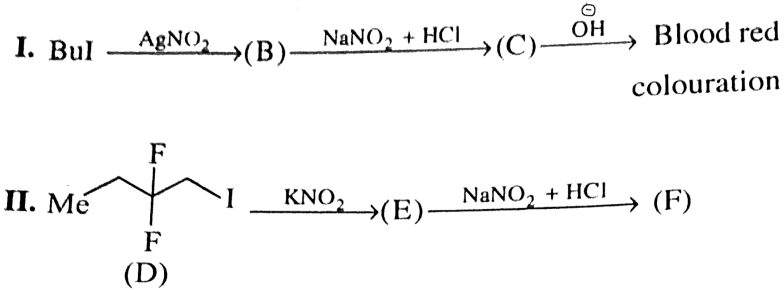

44.

Compound (B) is:

A. $Bu - NO_2$

B. $Bu - O - N = 0$

C. Both

D. None

Answer: a

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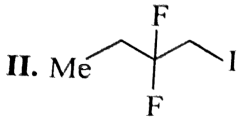
I. $BuI \xrightarrow{AgNO_2} (B) \xrightarrow{NaNO_2 + HCl} (C) \xrightarrow{\overset{\ominus}{OH}}$ Blood red colouration

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

(D)

45.

Compound (C) is:

A. $C_3H_7 - \underset{\underset{N.OH}{||}}{C} - NO_2$

B. $C_3H_7 - \underset{\underset{N.OH}{||}}{C} - ONO$

C. $C_3H_7 - \underset{\underset{N=O}{||}}{CH} - NO_2$

D. $C_3H_7 - \underset{\underset{N=O}{||}}{CH} - ONO$

Answer: c

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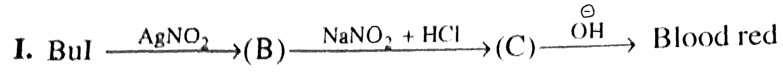
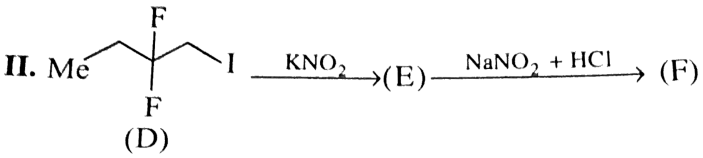
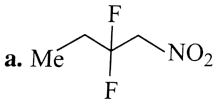
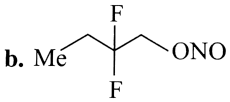




46.

Compound (E) is:

A. 

B. 

C. Both

D. None

Answer: b

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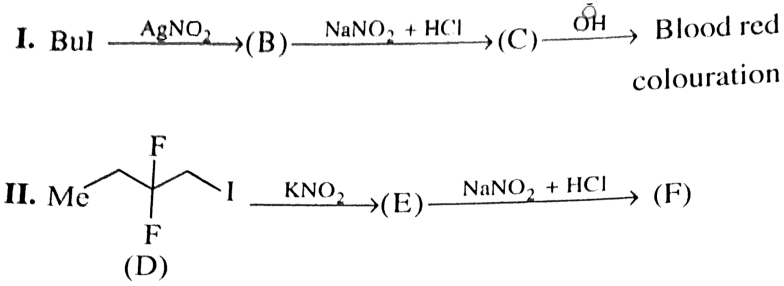
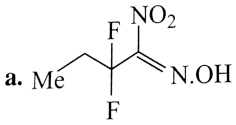


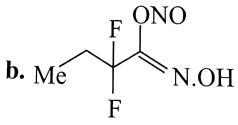
47.

Compound (F) is:

A.



B.



C. No reaction

D. Both (a) and (b)

Answer: c

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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

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

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

C. 

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

Answer: c

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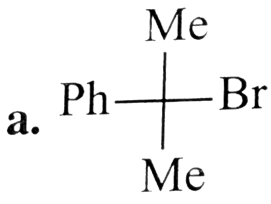
50. SN reaction is given by these compounds, which have a nuclophilic group and a good leaving EWG. It should be stable after leaving with bonding pair of $\bar{e}'s$ and it should have high polarisability.

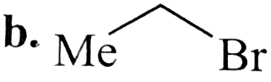
Nucliphilic aliphatic substituion reaction is mainly of two types SN^{-1} and SN^2. SN^{-1} mechanism is a two step process. Reaction velocity of

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. 

B. 

C. $MeBr$

D. All

Answer: a

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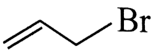
51. SN^2 reaction is a bimolecular reaction which takes places by the formation of $T.\ S.$ Veolcity of the reaction depends on the concentration of the substrate as well as the nucleophile.

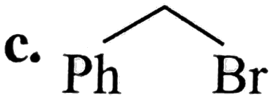
The reaction is favoureed by strong Nu^{o-} and in the presence of polar aprotic sovlent, optically active halides give. Walken inversion by SN^2 mechanism. The presence of hero group (atom) at $\beta - C$ atom, unsaturation at $\beta - C$ and $\left(\begin{matrix} O \\ || \\ -C- \end{matrix} \right)$ group at $\alpha - C$ 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. **b.** 

C. 

D. All

Answer: d

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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.

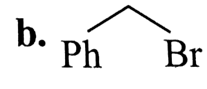
The reaction is favoureed by strong Nu^{o-} and in the presence of polar aprotic sovlent, optically active halides give. Walken inversion by SN^2 mechanism. The presence of hero group (atom) at $\beta - C$ atom, unsaturation at $\beta - C$ and $\left(\begin{matrix} O \\ || \\ -C- \end{matrix} \right)$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

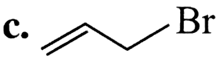
Allyl halides and benzyl halides give SN^1 and SN^2 reactions. Allyl halides alos give SN^2 mechanism EDG at ortho- and para- postions in benzyl

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

Watch Video 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.

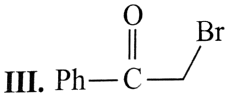
The reaction is favoureed by strong Nu^{o-} and in the presence of polar aprotic sovlent, optically active halides give. Walden inversion by SN^2 mechanism. The presence of hetro group (atom) at $\beta - C$ atom,

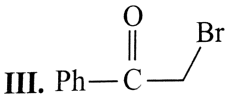
unsaturation at $\beta - C$ and $\left(-\overset{O}{\overset{||}{C}}- \right)$ group at $\alpha - C$ atomn favor SN^2 mechanism.

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. 

C. 

D. All

Answer: d

Watch Video Solution

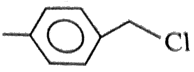
54. SN^2 reaction is a bimolecular reaction which takes places by the formation of $T.\ S.$ Veolcity of the reaction depends on the concentration of the substrate as well as the nucleophile.

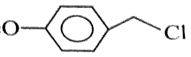
The reaction is favoureed by strong Nu^{o-} and in the presence of polar aprotic sovlent, optically active halides give. Walken inversion by SN^2 mechanism. The presence of hero group (atom) at $\beta - C$ atom, unsaturation at $\beta - C$ and $\left(-\overset{O}{\overset{||}{C}}- \right)$ group at $\alpha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

Watch Video Solution

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

Reaction I:

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

Reaction II:

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

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:

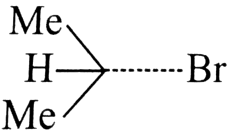
Treatment of isopropyl bromide with (Me_3CONa) at $40^\circ C$ gave almost exclusively compound $(A)(C_3H_6)$.

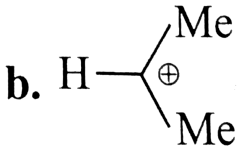
Reaction II:

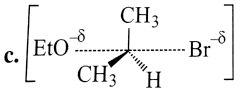
Treatment of $(i-PrBr)$ with $NaOC_2H_5$ at $30^\circ C$ yileled compound $(A)(C_3H_6)$ along with a small amount of an ether $(B)(C_5H_{12}O)$.

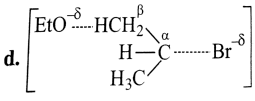
Compound (A) was readily oxidised by a neutral solution of cold dil. $KMnO_4$ to give a brown preciptate.

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

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

Reaction I:

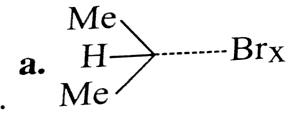
Treatment of isopropyl bromide with (Me_3CONa) at $40^\circ C$ gave almost exclusively compound $(A)(C_3H_6)$.

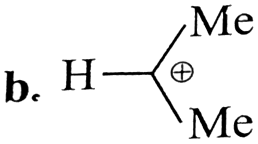
Reaction II:

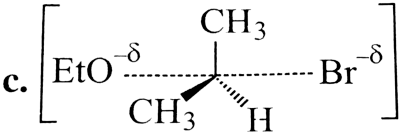
Treatment of $(i-PrBr)$ with $NaOC_2H_5$ at $30^\circ C$ yileled compound $(A)(C_3H_6)$ along with a small amount of an ether $(B)(C_5H_{12}O)$.

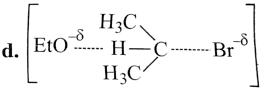
Compound (A) was readily oxidised by a neutral solution of cold dil. $KMnO_4$ to give a brown preciptate.

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

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

Reaction I:

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

Reaction II:

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

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. $Et-O-Et$

C. $i-Pr-O-Et$

D. $EtOMe$

Answer: c

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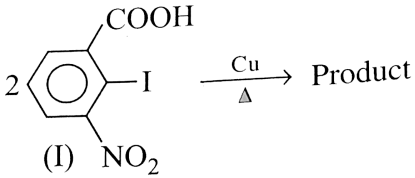
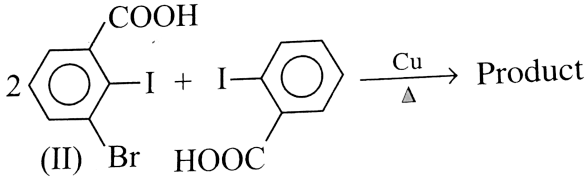
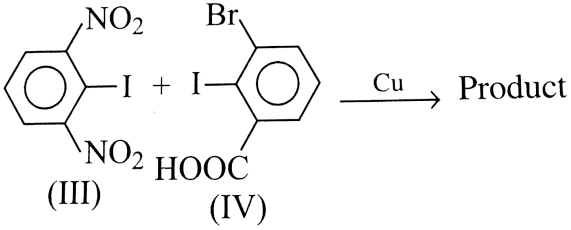
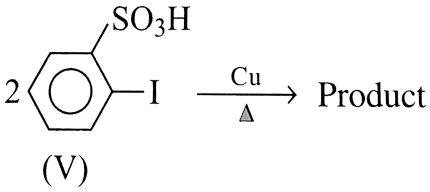
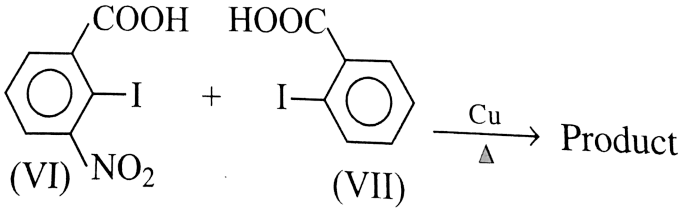
Exercises Linked Compreshension Type

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

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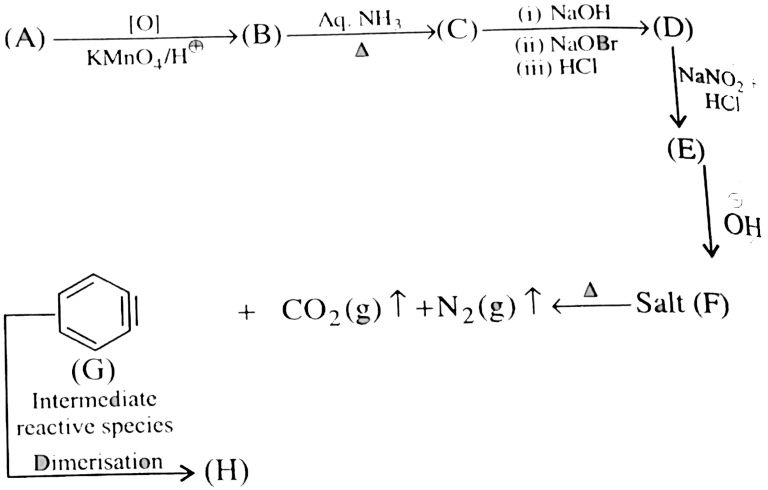
2. A hydrocation $(A)(C_8H_{10})(E)$ is a stream volatile compound and on nitration gives two mononitro derivatives. (A) gives the following reactions.



Compound `(A) is:

A. Ethylbenzene

B. p-Xylene

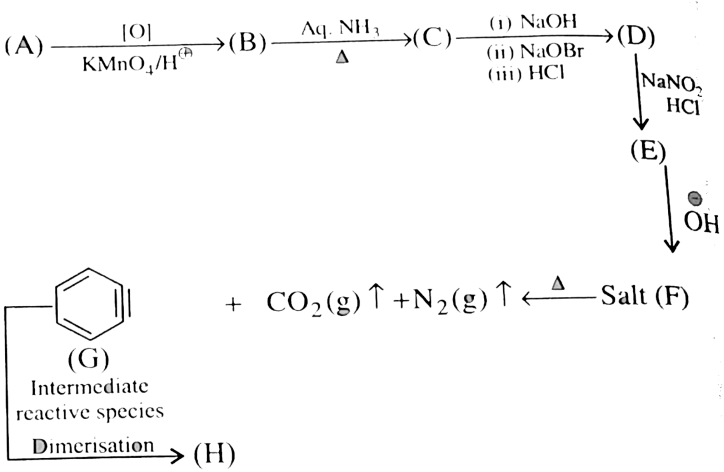
C. m-Xylene

D. o-Xylene

Answer: d

Watch Video Solution

3. A hydrocation $(A)(C_8H_{10})(E)$ 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

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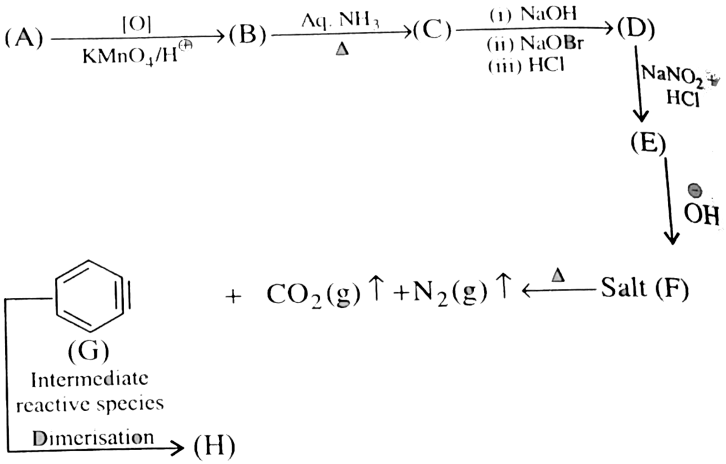
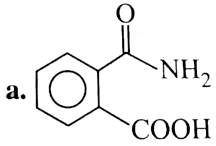
4. A hydrocation $(A)(C_8H_{10})(E)$ is a stream volatile compound and on nitration gives two mononitro derivatives. (A) gives the following reactions.

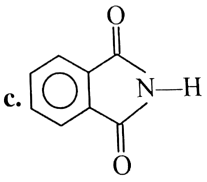


Compound `(C) is:

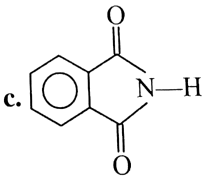
A.



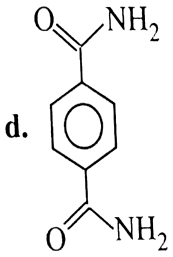
B.



C.



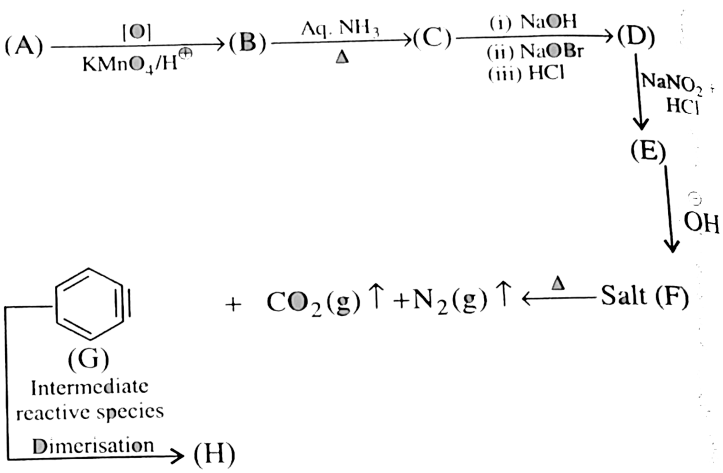
D.



Answer: c

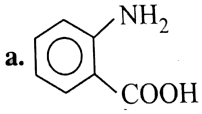
Watch Video Solution

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

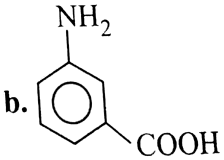


Compound `(D) is:

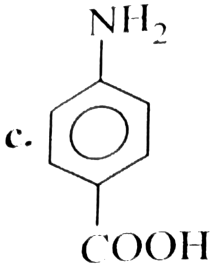
A.

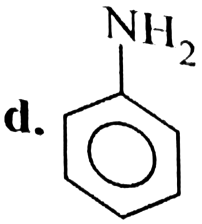


B.



C.



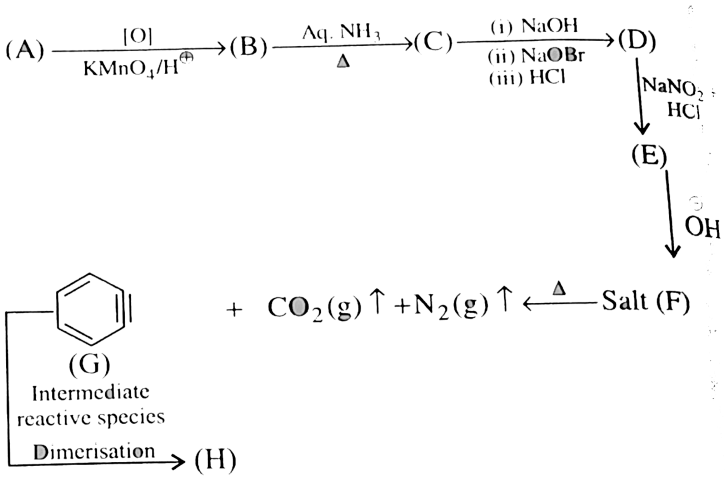
d. 

D.

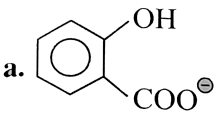
Answer: a

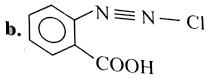
Watch Video Solution

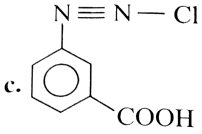
6. A hydrocation $(A)(C_8H_{10})(E)$ is a stream volatile compound and on nitration gives two mononitro derivatives. (A) gives the following reactions.

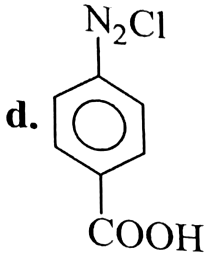


Compound `(E) is:

A. 

B. 

C. 

D. 

Answer: b

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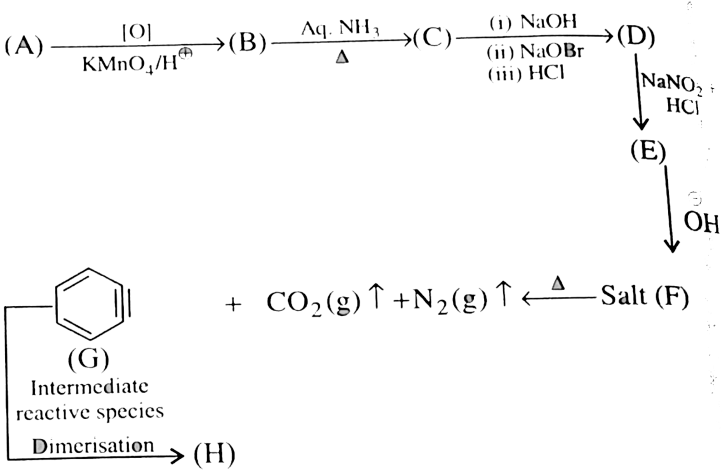
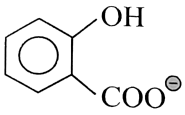
7. A hydrocation $(A)(C_8H_{10})(E)$ is a stream volatile compound and on nitration gives two mononitro derivatives. (A) gives the following reactions.



Compound `(F) is:

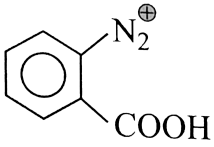
A.

a.



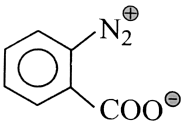
B.

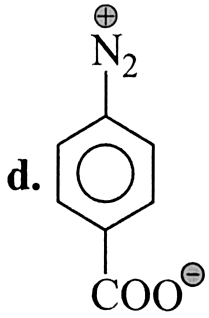
b.



C.

c.





D.

Answer: c

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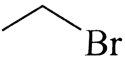
8. SN reaction is given by these compounds, which have a nuclophilic group and a good leaving EWG. It should be stable after leaving with bonding pair of $\bar{e}'s$ and it should have high polarisability.

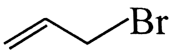
Nucliphilic aliphatic substituion reaction is mainly of two types SN^{-1} and SN^2. SN^{-1} mechanism is a two step process. Reaction velocity of SN^{-1} depends only on the concentration of the subtrate. It proceeds via the formation of carbocation, optically active substrate gives $(\oplus)$ and $(o-)$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

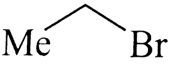
In most of the cases, the product usually consists of $5-20\,\%$ inverted

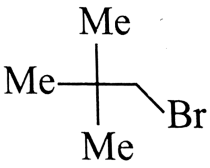
and $(95 - 80\,\%)$ racemised species. The more stable is the carbocation, the greater is the propotion of racemission. In solvolysis reaction, the more nucleophillic is the solvent, the greater is the proportion of inversion.

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

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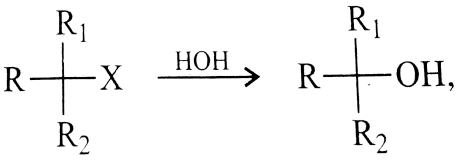
9. SN reaction is given by these compounds, which have a nuclophilic group and a good leaving EWG. It should be stable after leaving with bonding pair of $\bar{e}'s$ and it should have high polarisability.

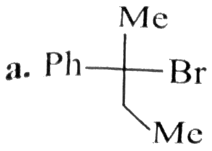
Nucliphilic aliphatic substituion reaction is mainly of two types SN^{-1} and SN^2. SN^{-1} mechanism is a two step process. Reaction velocity of SN^{-1} depends only on the concentration of the subtrate. It proceeds via the formation of carbocation, optically active substrate gives $(\oplus)$ and $(o-)$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

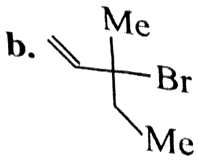
In most of the cases, the product usually consists of $5-20\,\%$ inverted and $(95-80\,\%)$ racemised species. The more stable is the carbocation, the greater is the propotion of racemisation. In solvolysis reaction, the more nucleophillic is the solvent, the greater is the proportion of inversion.

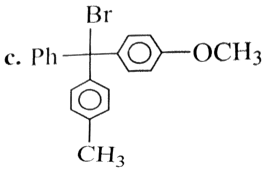
For the reaction

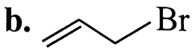


which substrate will give maximum racemismision ?

A. 

B. 

C. 

D. 

Answer: c

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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 $\beta - C$ atom, unsaturation at $\beta - C$ and $\begin{pmatrix} O \\ || \\ -C- \end{pmatrix}$ group at $\alpha - C$ 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

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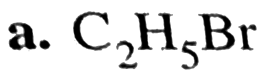
11. SN^2 reaction is a bimolecular reaction which takes places by the formation of $T.\ S.$ Veolcity of the reaction depends on the concentration of the substrate as well as the nucleophile.

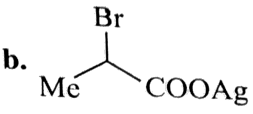
The reaction is favoureed by strong Nu^{o-} and in the presence of polar aprotic sovlent, optically active halides give. Walken inversion by SN^2 mechanism. The presence of hero group (atom) at $\beta - C$ atom, unsaturation at $\beta - C$ and $\left(\begin{array}{c} O \\ || \\ -C- \end{array} \right)$ group at $\alpha - C$ 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. C_2H_5Br

B. 

C. 

D. $CH_2 = CH_2$

Answer: c

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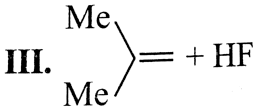
Exercises Multiple Correct

1. Both $t-$ butyl and $(-SO_3H)$ 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 $ducedbyu\sin g$: I. Me_(3)C - Cl + AlCl_(3)

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

III. **III.**  + HF

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 $(-SO_3H)$ group as a blocking group, becuase $t-$ butyl group activates the ring to further SE reaction.

Answer: (a, b, c, d)

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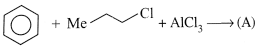
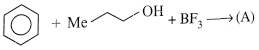
2. Which compound in each of the following paris will react faster in SN^2 reaction with HO^{o-} ?

$a.\ CH_3Br$ or CH_3I

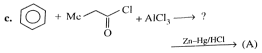
b. $(CH_3)_3\mathbb{C}l$ or CH_3Cl

c. $CH_2=CHBr$ or $CH_2=CH-CH_2Br$

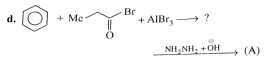
A. a. 

B. b. 

C.



D.



Answer: (c, d)

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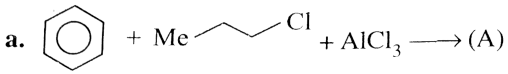
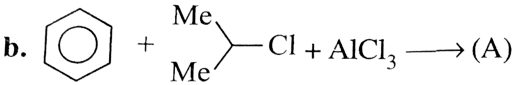
3. Which of the following are the best methods for the preparation of cument (A) ?

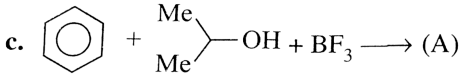
A.



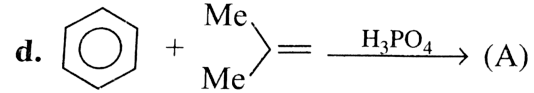
B.



C.



D.



Answer: (b, c, d)

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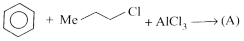
4. Which of the following statements are correct.

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

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

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

D. 

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

Answer: (b, c, d)

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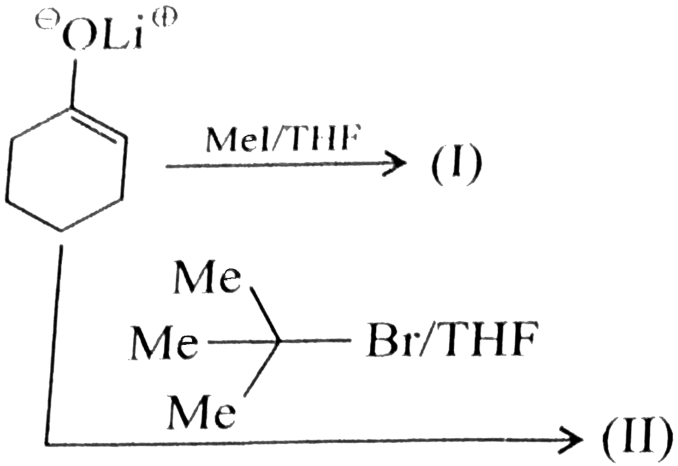
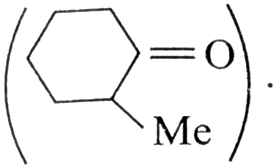
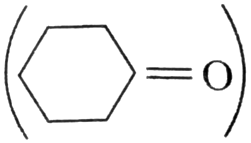
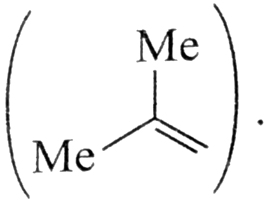


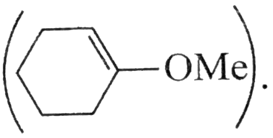
5.

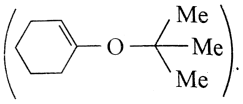
The products (I) and (II) are:

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)

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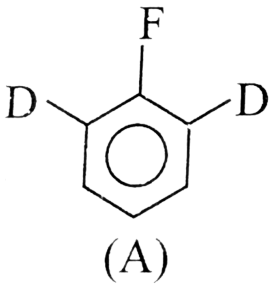
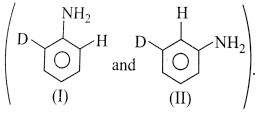
6. 

$\xrightarrow[\text{Liq. } NH_3]{NaNH_2}$ Products.

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)

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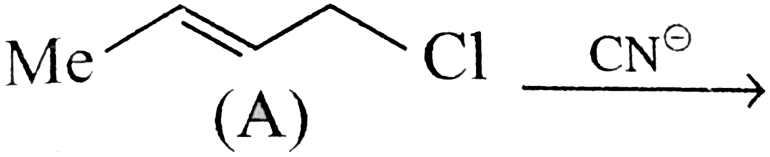
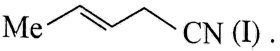
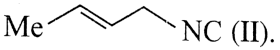
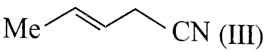
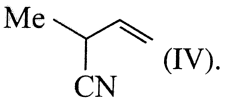
7. 

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

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8. 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)

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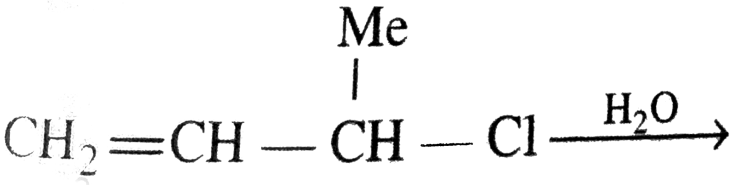
9. 

(A)

Whichof the following statemetns are correct ?

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

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10. 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)

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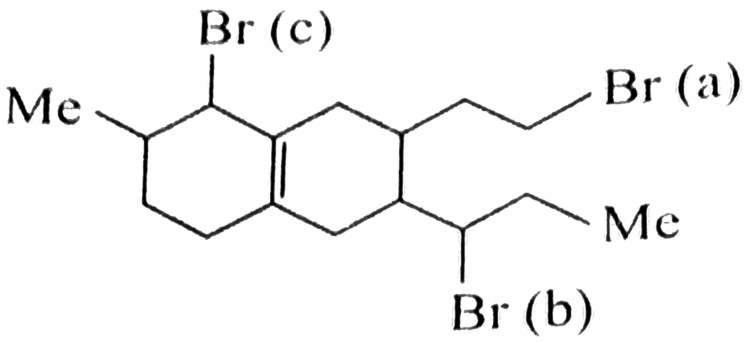
11. Consider the following compound:



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)

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12. Consider the following reactiions:

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

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

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

IV. $Me_3C-\underset{\underset{Me}{|}}{\overset{\overset{Me}{|}}{C}}-Cl \xrightarrow{\overset{\ominus}{O}H} Me_3C-\underset{\underset{Me}{|}}{\overset{\overset{Me}{|}}{C}}-OH$

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)

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

A. SN^1

B. SN^2

C. $E1$

D. $E2$

Answer: (b, d)

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

A. SN^1

B. $E1$

C. $E2$

D. $ElcB$

Answer: b

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

A. SN^2

B. $E1$

C. $E2$

D. $ElcB$

Answer: d

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

A. SN^1

B. SN^2

C. $E2$

D. $ElcB$

Answer: a

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17. 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

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18. 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)

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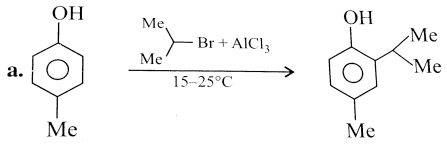
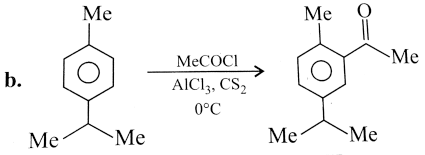
19. In which fo the following reactions is the correct major product formed?

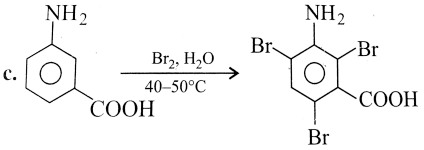
A.



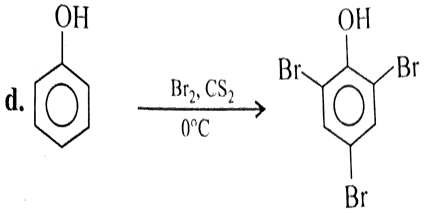
B.



C.



D.



Answer: (a, b, c)

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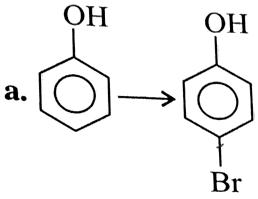
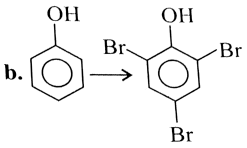
20. Which of the following syntheses could not be doen without involving blocking positions on the ring?

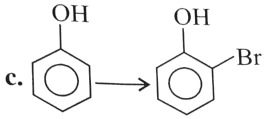
A.



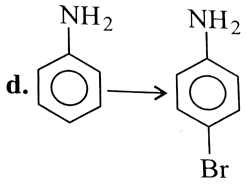
B.



C.



D.



Answer: c

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

A. Benxolation

B. Acetylaction

C. Tosylation

D. Sulphonation

Answer: (a, b, c)

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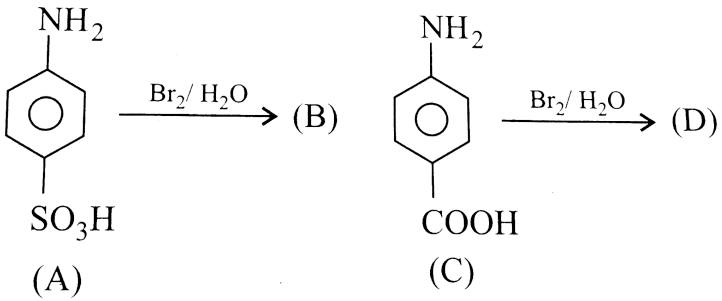
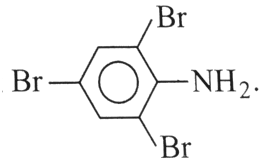
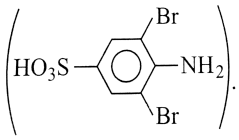
22. In the following reactions:

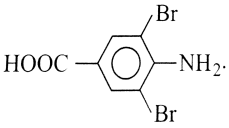


Which of the following staements are correct about the above reactions?



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

B. B is 

C. D is 

D. The above reaction is called ipso substiution.

Answer: (a, b)

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23. Which are the sources of phenol?

A. Cumene

B. Hydrolysis of benzene diazonium salt

C. Middle oil of coal tar distilation

D. Reaction of diazonium salt with H_3PO_2

Answer: (a, b, c)

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

A. Napthalene

B. Phenol

C. Benzene

D. Pyride

Answer: a

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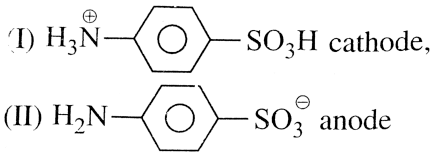
25. Sulfanillic acid at $pH = 2$ and 12 exists as....and migrates towards..... Respectively.

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

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26. Consider the following reactions:

$I.\ C_2H_5 - I + NH_3 \rightarrow C_2H_5N^{\oplus}H_3 + I^{o-}$

II. $C_2H_5 - I + \ddot{P}H_3 \rightarrow C_2H_5P^{\oplus}H_5 + I^{o-}$

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 the rate of SN^2 reactions increases with increase in solvent polarity?

A. (I)

B. (II)

C. (III)

D. (IV)

Answer: (a, b)

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27. 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)

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28. Consider the folliwng reactions:

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

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

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

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

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

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

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

Answer: (b, d)

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29. Which benzene sulphonic acid and $p-$ nitrophenol are treated with $NaHCO_3$, the gases released, respectively are :

A. SO_2, NO_2

B. SO_2, NO

C. SO_2, CO_2

D. CO_2, CO_2

Answer: d

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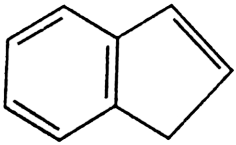
30. The decreasing order of pK_a value of the folliwng is:

(I) $CH \equiv CH$

(II) 

(III) 

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

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

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

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

Answer: b

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31. 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

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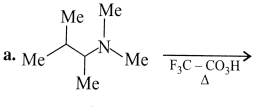
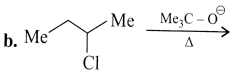
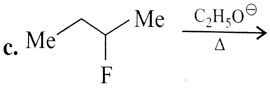
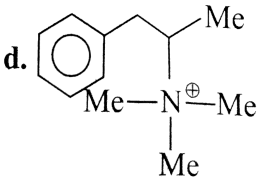
32. Which of the following will give Hofamann alkene?

A. 

B. 

C. 

D. 

Answer: (a, b, c)

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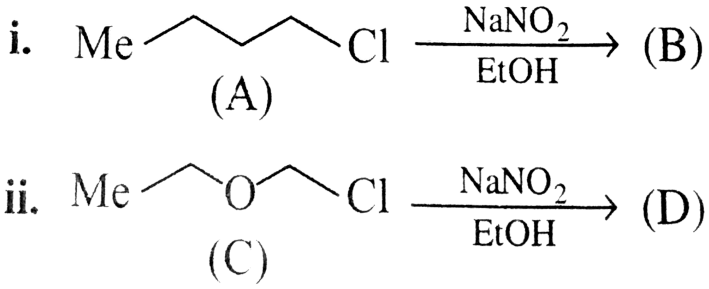
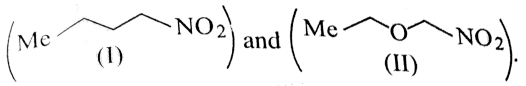
Exercises Multiple Correct Answers Type

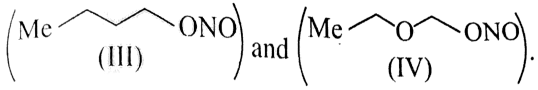
1. 

Which of the following statements is/are correct for the above reactions?

A. (B) and (D) are respectively:



B. (B) and (D) are respectively:



C. (B) is (I) and D is (IV)

D. (B) is (III) and D is (II).

Answer: $(c$

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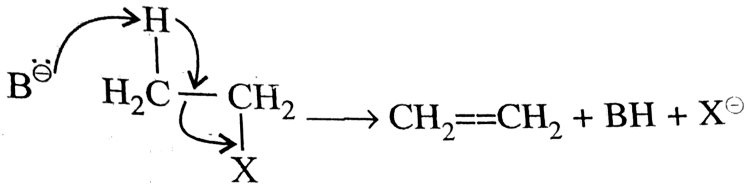
2. $\beta -$ Elimination or anti-eliminination reaction is carried out with base $\left(B^{o-}\right)$ as shown below:



The following bases are used.

I. $\overset{o-}{O}H$

II. RO^{o-}

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

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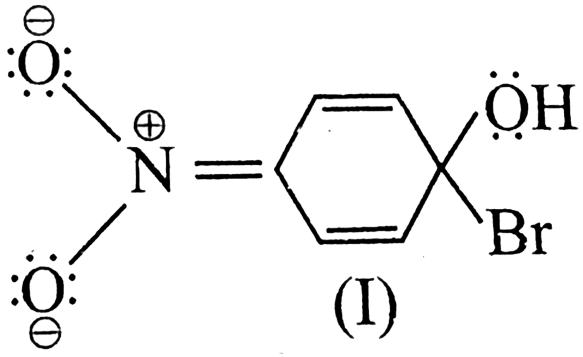
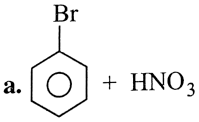
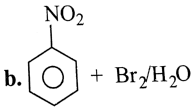
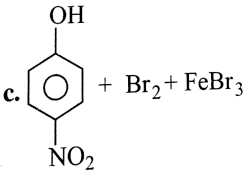
3. Which combination of reactants will not give species (I) shown as a reactive intermediate ?

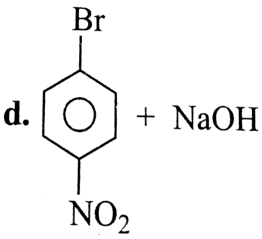


(I)

A. a.  + HNO_3

B. b.  + Br_2/H_2O

C. c.  + Br_2 + $FeBr_3$

D. d.  + NaOH

Answer: (a, b, c)

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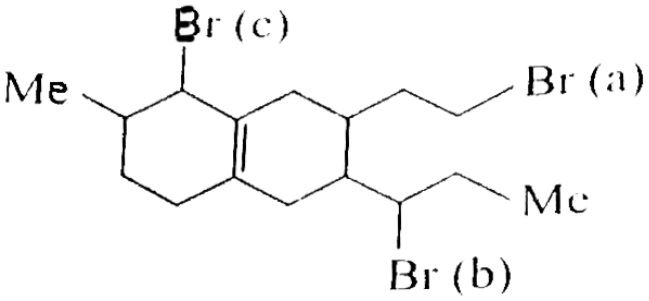
4. Consider the following reactiions:



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)

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5. 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

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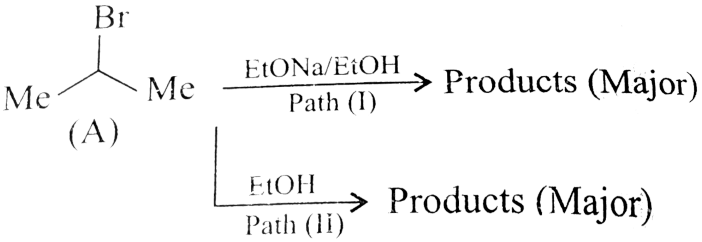
6. Consider the following reactions.



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

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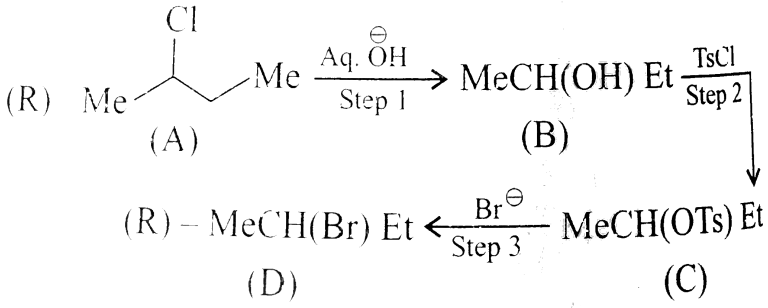
7. In the conversation of optically active (R) from of $2-$ chlorobutane to (R) from of $2-$ bromobutane the following sequence of reactiosn is cariied out.ltbgt



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)

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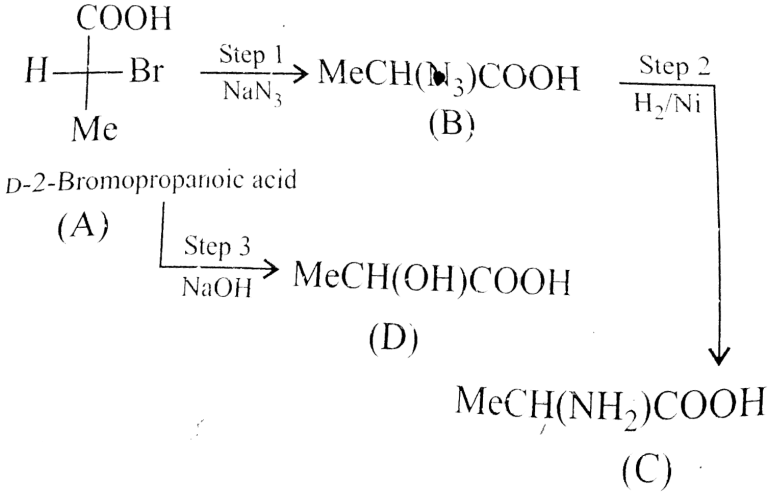
8. In which of the following steps does inversion occur?



A. Step 1

B. Step 2

C. Step 3

D. None

Answer: (a, c)

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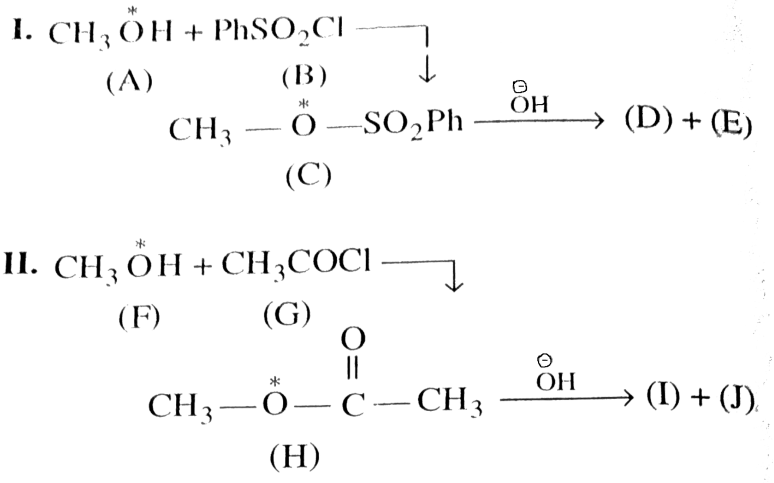
9. Consider the following reactions.



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

A.

$$(D) = CH_3OH, (E) = PhSO_2O^*Na, (I) = CH_3O^*H, (J) = CH_3$$

B.

$$(D) = CH_3O^*H, (E) = PhSO_2Na, (I) = CH_3OH, (J) = CH_3CO$$

C. $(D0 = CH_3O^*H$, (E) = PhSO_(2)Na, (I) = CH_(3) O^(**)H, (J) =

CH_(3)COONa`

D.

$$(D) = CH_3OH, (E) = PhSO_2O^*Na, (I) = CH_3OH, (J) = CH_3C$$

Answer: a

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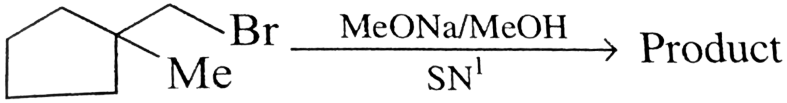
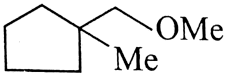
10. 

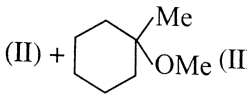
Which of the following statemetns are correct?

A. The product is 

(I). $,(I)$

(II).

B. The product is $,(II)$

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)

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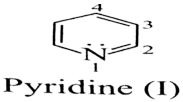
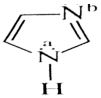
11. 



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)

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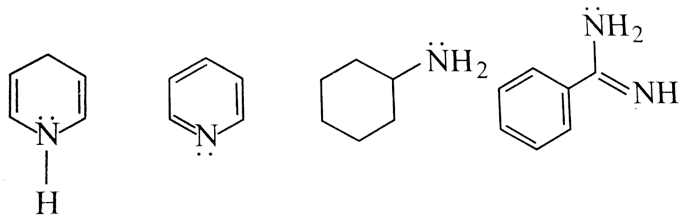
12.



Which of the following statements are correct?

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

B. (I) is aromatic, (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 conjugate acid of (IV) is more stabilised than the conjugate acid of (II).

Answer: (c, d)

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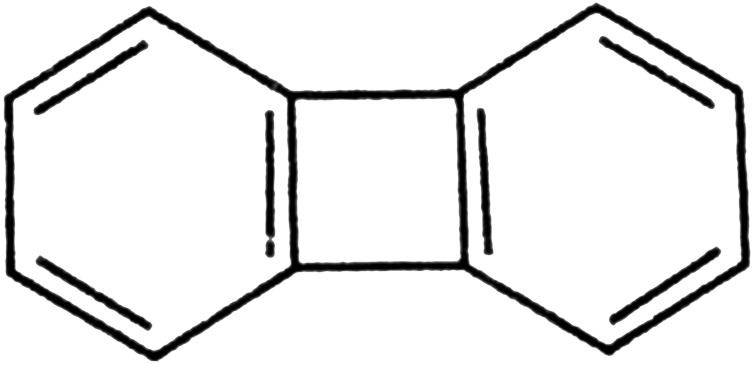
13. The name of the compound



is:

A. Dibenzocylobutadiene

B. Dibenzocyclobutane

C. Biphenylene

D. Dibenzocyclobutene

Answer: (a, b, c)

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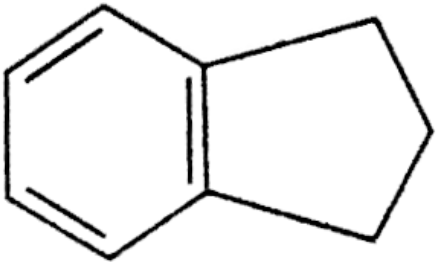
14. The name of the compound



is:

A. Indane

B. Benzocyclopentene

C. Benzocyclopentane

D. Benzocyclopentane

Answer: (a, b, c)

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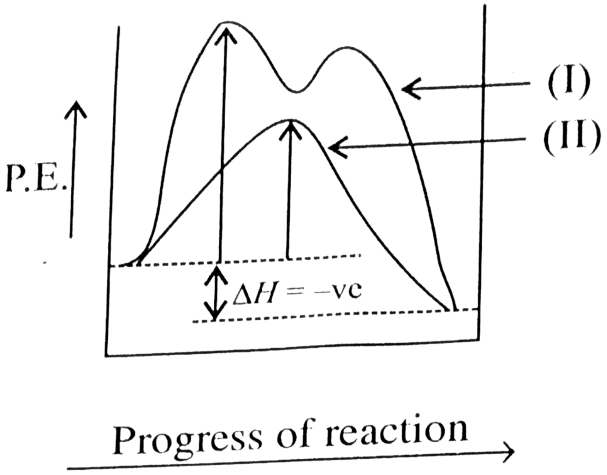
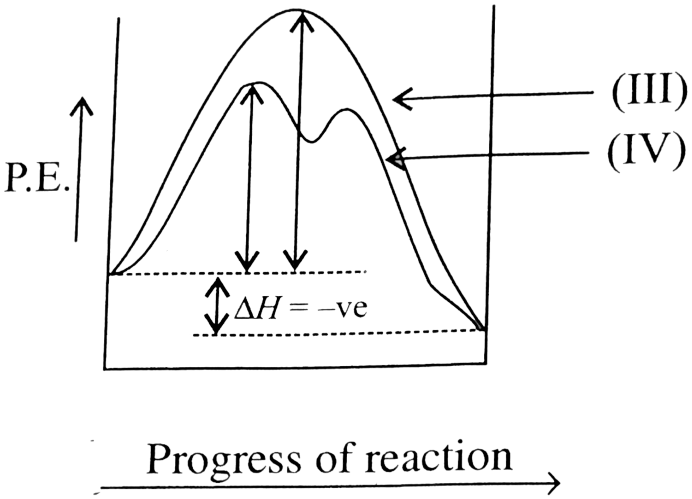
15. Energy diagram of SN^1 and SN^2 reactions. The order of hydrolysis of RX by SN^1 is $3^\circ > 2^\circ 1^\circ RX$ and by SN^2 path is $1^\circ > 2^\circ > 3^\circ RX$.





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)

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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

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

I. $PhN^{\oplus}Me_3$, II. $PhCH_2NMe_3$

III. $PhMe$, IV. $PhNMe_2$

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

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

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

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

Answer: b

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3. The decreasing order of aromaticity fo the following is

I. Benzene, II. Napthalene, III. Anthrance

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

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

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

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

Answer: a

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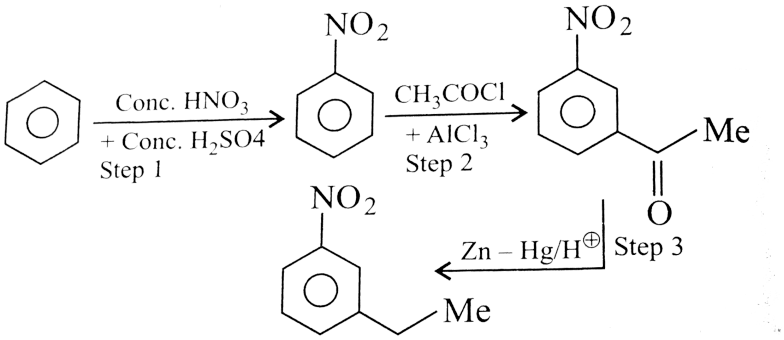
4. In the following reaction, which of the folliwing steps is wrong?



A. Step 1

B. Step 2

C. Step 3

D. None

Answer: b

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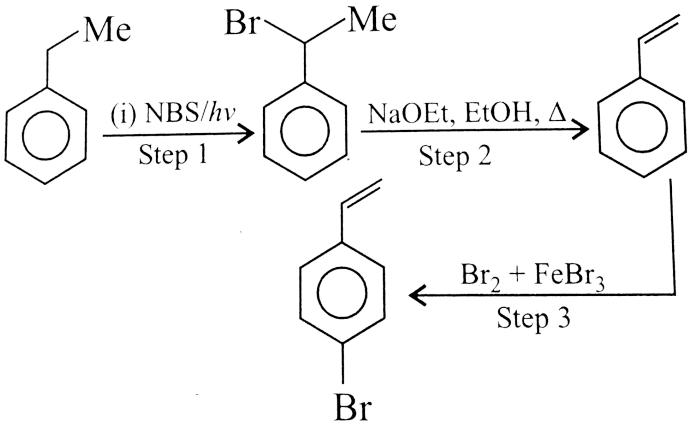
5. In the following reaction, which of the folliwing steps is wrong?



A. Step 1

B. Step 2

C. Step 3

D. None

Answer: *c*

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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

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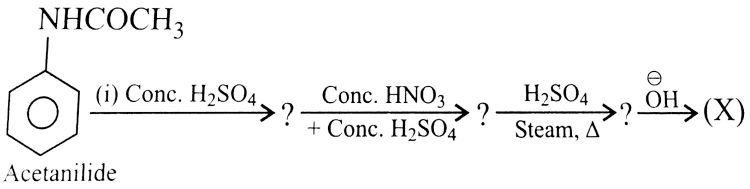
7. The final product (X) in the following reactionis: $NHCOCH_3$



A. $2-$ Nitroaniline

B. $3-$ Nitroaniline

C. $4-$ Nitroaniline

D. Sulphanilic acid

Answer: a

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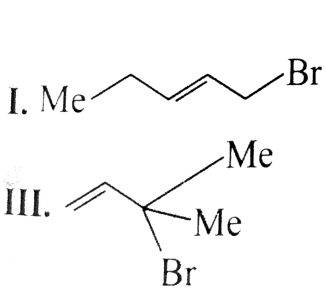
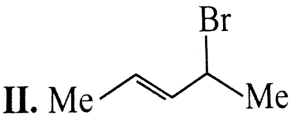
8. Which of the following halides will be most reactive in SN^2 reaction and SN^1 reaction respectively?





A. $(I), (II)$

B. $(II), (I)$

C. $(I), (III)$

D. $(III), (I)$

Answer: c

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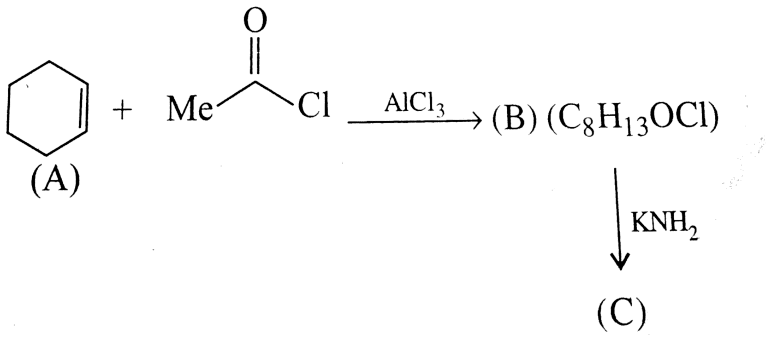
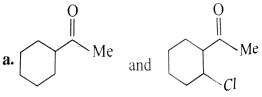
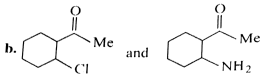
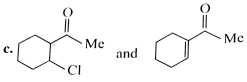
9.

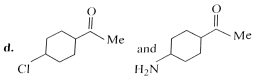


Compounds (B) and (C) respectively are:

A. 

B. 

C. 

D. 

Answer: c

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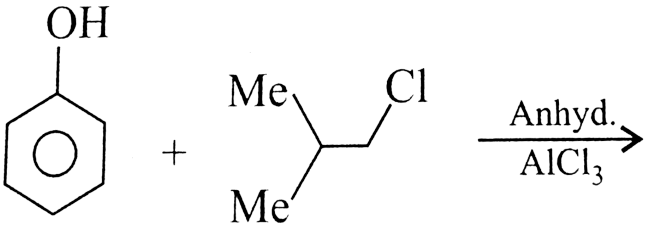
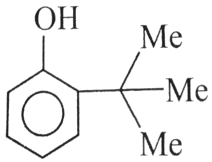
10. Give the major product of the folliwng reaction.



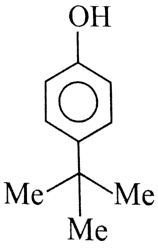
A.

a.

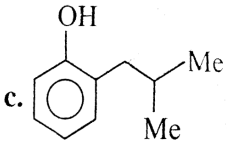


B.

b.

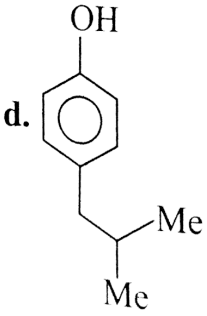


c.



C.

d.



D.

Answer: b

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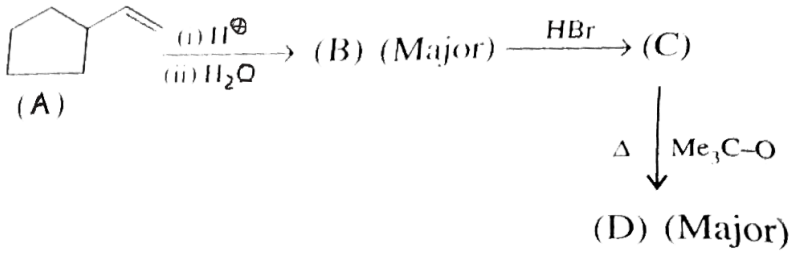
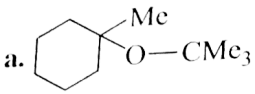
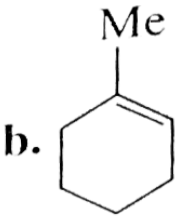
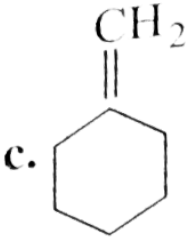
11.

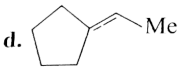


Compound (D) is:

A. 

B. 

C. 

D. 

Answer: *c*

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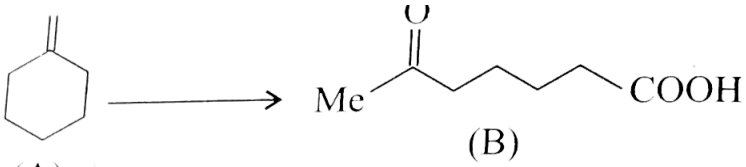
12. 

(A) (B)

The above conversion can be carried out by which process.

A. i. HBr + peroxide, ii. Me_3CO^{o-}, Δ, iii, O_3 / H_2O

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

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

D. HCl + peroxide

Answer: b

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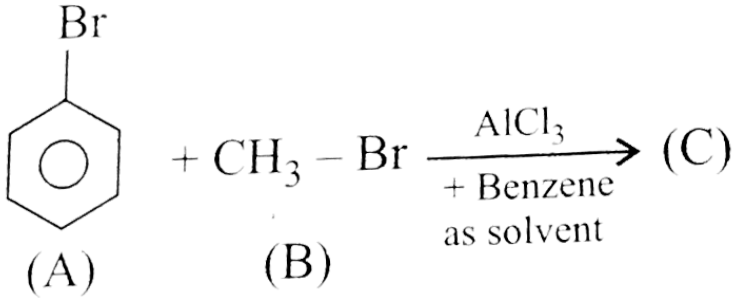
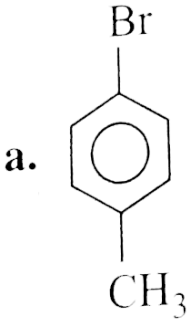
13.

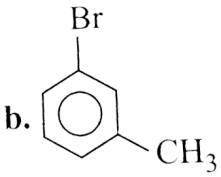


Product (C) is:

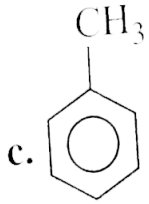
A.



B.



C.



D. None of these

Answer: c

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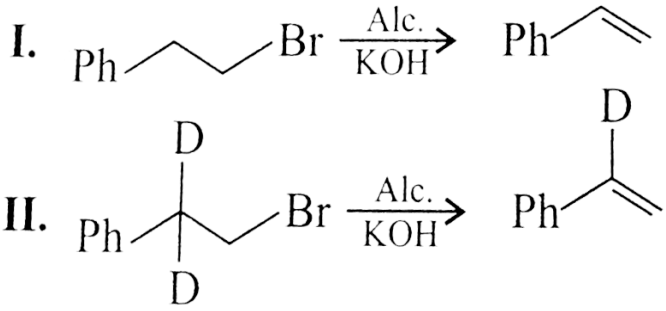
14. In the follwing reactionsL



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

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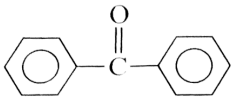
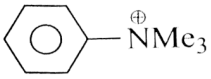
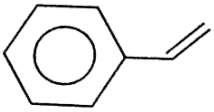
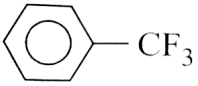
15. In which case will SE not be in $m-$ position?

A. a. 

B. b. 

C. c. 

D. d. 

Answer: a

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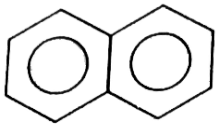
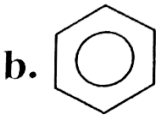
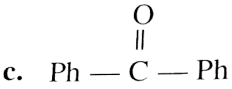
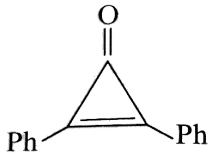
16. Which of the folliwng has the highest dipole moment?

A. a. 

B. b. 

C. c. 

D. d. 

Answer: d

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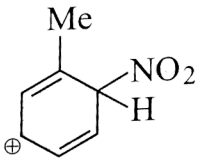
17. Which of the following is the most stable carbonium or benzenium ion?

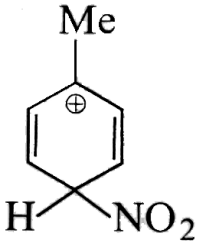
A.

a.



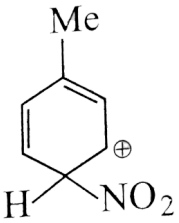
B.

b.



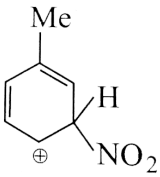
C.

c.



D.

d.



Answer: b

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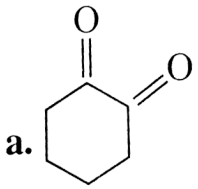
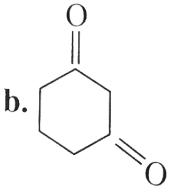
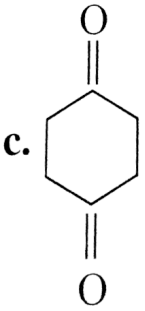
18. Which of the following ketonic compound is the least stable?



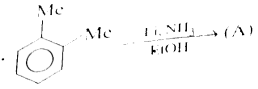
A.



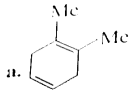
B.

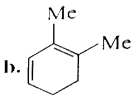


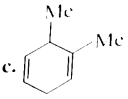
C.

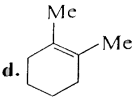
32. 

(A) would be:

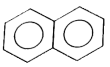
a. 

b. 

c. 

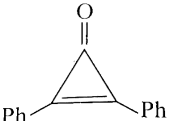
d. 

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

a. 

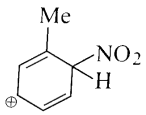
b. 

c. 

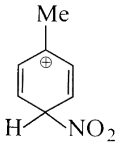
d. 

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

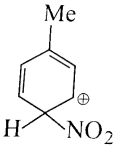
a.



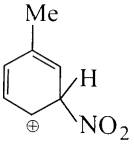
b.



c.

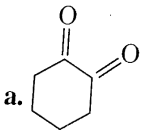


d.

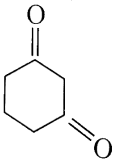


35. Which of the following ketonic compound is the least stable?

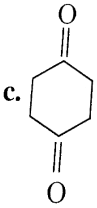
a.



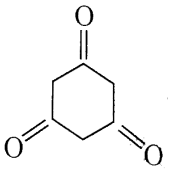
b.



c.



d.



D.

Answer: d

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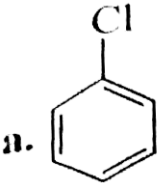
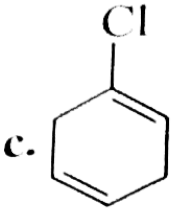
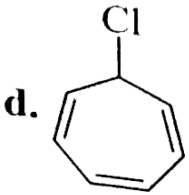
19. Which of the following compounds will give curdy precipate with $AgNO_3$ solution?

A. a. 

B. b. $CH_2{=}CH{-}Cl$

C. c. 

D. d. 

Answer: d

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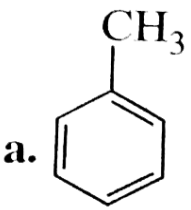
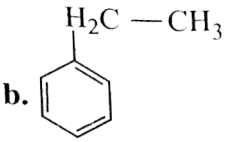
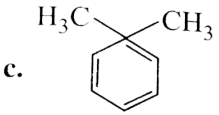
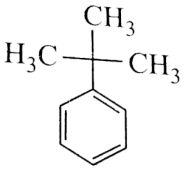
20. Which of the folliwng compounds is the most reactive towards electrophilic substitution reaction?

A. a. 

B. b. 

C. c. 

D. d. 

Answer: a

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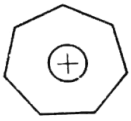
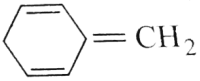
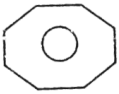
21. Which of the folliwng is the most stable species?

A. a. 

B. b. 

C. c. 

D. d. 

Answer: a

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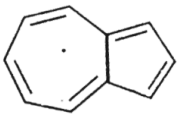
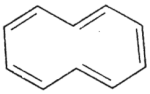
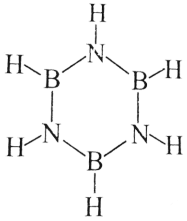
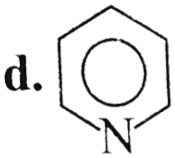
22. Which of the following in not aromatic in nature?

A. a. 

B. b. 

C. c. 

D. d. 

Answer: b

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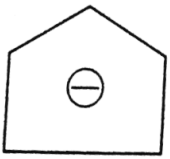
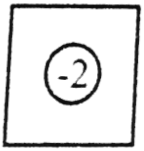
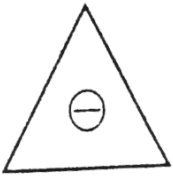
23. Which of the following species will be least stable?

A. a. 

B. b. 

C. c. 

D. d. 

Answer: d

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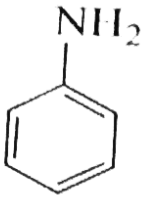
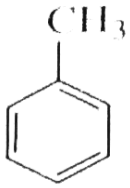
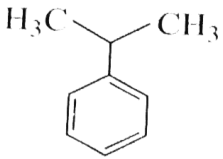
24. Which of the follwing compounds will undergo Friedel Creadfts alylation with faster rate?

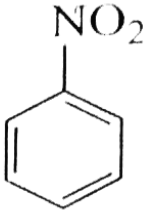
A. a. 

b. 

B.

c. 

C.

d. 

D.

Answer: b

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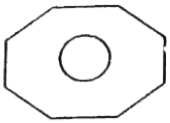
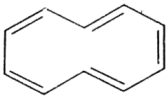
25. Which of the following is anti-aromatic in nature?

a. 

A.

B. b. 

C. c. 

D. d. 

Answer: b

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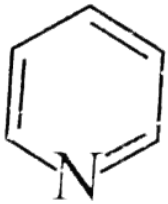
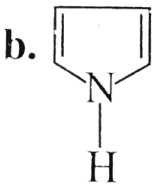
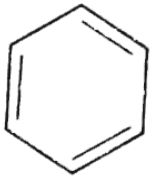
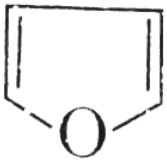
26. Which of the following aromatic compounds is least reactive towards electrophilic substituions?

A. a. 

B. b. 

C. c. 

D. d. 

Answer: a

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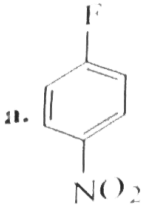
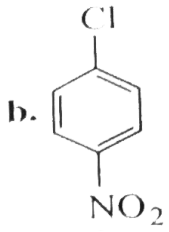
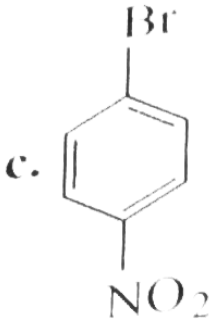
27. Which of the folliwng compounds will show faster $ArSN^2$ reactions?

A. a. 

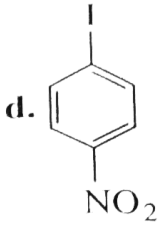
B.



C.



D.



Answer: a

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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

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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

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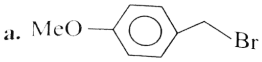
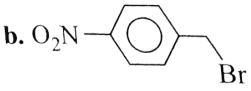
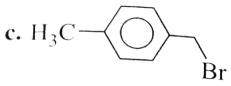
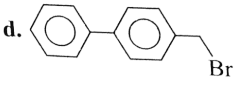
30. Which of the following will give SN^2 mechanism?

A. 

B. 

C. 

D. 

Answer: b

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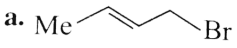
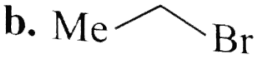
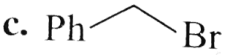
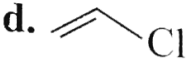
31. Which of the following compounds gives SN^1, SN^2 and SN^2 mechanisms?

A. a. 

B. b. 

C. c. 

D. d. 

Answer: a

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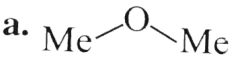
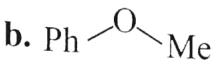
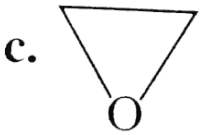
32. Which of the folliwning ether wil always give SN^2 mechanism in acidic as well as basic conditions?

A. a. 

B. b. 

C. c. 

D. All

Answer: d

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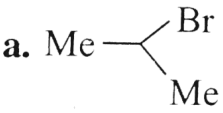
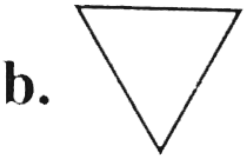
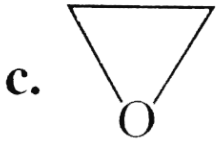
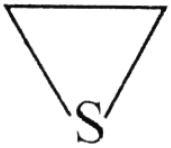
33. Which of the follwoign ether will always give SN^2 mechanism in acidic as well as basic conditions?

A. **a.** 

B. **b.** 

C. **c.** 

d. 

D.

Answer: d

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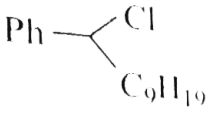
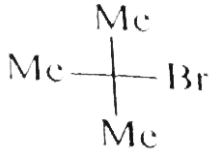
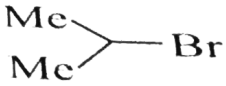
34. Which of the following substrates will gave racemised product?

a. 

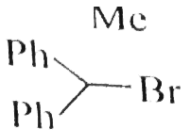
A.

b. 

B.

c. 

C.

d. 

D.

Answer: a

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

D. All have the same energy of activation.

Answer: c

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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

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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

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38. A solution of (+)2-chloro-2-phenylethane 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

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

A. 3

B. 4

C. 5

D. 6

Answer: d

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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

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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

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42. 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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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67. $\underset{\text{Specific rotation} = +50^\circ}{Ph - CH(OH)CH_3} \xrightarrow{SOCl_2} \underset{\displaystyle Cl}{\overset{\displaystyle |}{PhCH}} - CH_3$

What si the specific rotation of the product?

A. $+50^\circ$

B. $+60^\circ$

C. -60°

D. Zero

Answer: b

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68. $\underset{\text{Specific rotation} = +50^\circ}{Ph - CH(OH)CH_3} \xrightarrow{SOCl_2} PhCH(Cl) - CH_3$

Which of the following acts as a nucelphilic?

A. CI^{o-}

B. $\overset{o-}{O}H$

C. SO_2

D. None

Answer: a

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69. $\underset{\text{Specific rotation} = +50^\circ}{Ph - CH(OH)CH_3} \xrightarrow{SOCl_2} PhCH(Cl) - CH_3$

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

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70. $\underset{\text{Specific rotation} = +50^\circ}{Ph - CH(OH)CH_3} \xrightarrow{SOCl_2} \underset{\displaystyle Cl}{\overset{\displaystyle |}{PhCH}} - CH_3$

Which of the following acts as a leaving group?

A. $\overset{\theta}{O}H$

B. Cl^θ

C. SO_2

D. $E2$

Answer: c

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71. $CH_3 - CH(Cl) - C_2H_5 \xrightarrow{Alc.KOH} CH_3 - CH = CH - CH_3$

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

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72. Alkyl halides can be obtained by all methods except

A. $CH_3CH_2OH + HX / ZnCl_2$

B. $CH_2 = CH - CH_3 \underset{475K}{\overset{SO_2Cl_2(\rightarrow)}{}}$

C. $C_2H_5OH + NaCl$

D. $CH_3COOAg + Br_2 / CCl_4$

Answer: c

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73. Neopentyl 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

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74. In the reaction

$CH_3C \equiv C^- Na^+ + (CH_3)_2$CHCl $\rightarrow$ Product the product fomed 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

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75. In order to get ethanethiol from bromoethane, the reagent used is :

A. Sodium bisulphide

B. Sodium sulphide

C. Potassium thicyanate

D. Potassium sulphide

Answer: a

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76. 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

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77. 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

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78. Which of the following cannot be used for the preaparation of iodofrom ?

A. Acetone

B. Methanol

C. Ethanol

D. Acetealdeyde

Answer: b

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79. 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

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80. 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

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81. 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

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82. Which of the following is a geminal dihalide ?

A. Ethylene dibromide

B. Propylidene chloride

C. Isopropyl bromide

D. None of the above

Answer: b

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83. $C_2H_5I \xrightarrow{AgNO_2} \underset{(\text{major product})}{\text{X. Here X}}$ is :

A. $C_2H_5 - \overset{\overset{O}{||}}{N} \to O$

B. $C_2H_5 - O - N = O$

C. $C_2H_5 - N = O$

D. All of above

Answer: c

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84. Which of the following sequence would yield m-nitrochlorobenzene (Z) from benzene ?

A. $\text{Benzene} \xrightarrow{Cl_2 / FeCl_3} (X) \xrightarrow[H_2SO_4]{HNO_3} (Z)$

B. $\text{Benzene} \xrightarrow{H_2SO_4 / HNO_3} (Z)$

C. $\text{Benzene} \xrightarrow{H_2SO_4 / HNO_3} (X) \xrightarrow{FeCl_3 / Cl_2} (Z)$

D. All of these above will produce (Z)

Answer: c

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85. $C_3H_7Cl \xrightarrow{KOH\,(alc.)} (A) \xrightarrow[770K]{Cl_2\,(g)} (X).\ (X)$ can be:

A. Vinyl chloride

B. Allyl chloride

C. Ethyl chloride

D. Ethyl isodide

Answer: b

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86. 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

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87. 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

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88. 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

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89. 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

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90. Under the influene of air and light chloroform decomposes into

A. CCl_4

B. $(CH_3)_2 \overset{OH}{\underset{|}{C}} - CCl_3$

C. $COCl_2$

D. $\mathbb{C}l_3CHO$

Answer: c

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91. When iofoform is heated with silver poweder, the gaseous product formed is:

A. Ehthene

B. Ethyne

C. Ethane

D. Silver iodate

Answer: b

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92. 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

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93. $C_6H_5Cl \xrightarrow[625\ \mathrm{K}\ 300\ \mathrm{atm}]{NaOH\ (aq.)} \ldots$ The product can be:

A. Benzal

B. Sodium benzote

C. Benzol

D. Sodium phenate

Answer: d

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94. $(CH_3)_2CHI \xrightarrow[EtOH]{KOH} A \xrightarrow[475K]{SO_2Cl_2} B$

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

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95. In given sequence of reaction predict X

$X \xrightarrow[H_2O]{KOH} Y \xrightarrow[633K]{Al_2O_3} Z \xrightarrow{[O]} 2$ 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

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96. Iodofrom can be prepared from:

A. Isoamyl alcohol

B. $\alpha -$ Phenyl ethanol

C. Isobutyl alcohol

D. $\beta -$ Phenyl ethanol

Answer: b

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97. When bromoethane is treated with potassium sulphide, the main product formed is

A. Ethanethiol

B. Ethanol

C. Mustrad gas

D. Thioethyl ethane

Answer: d

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98. $(CH_3)_2CHCl + NaI \rightarrow (CH_3)_2CHI + NaCl$

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

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99. Isopropyl alcohol is heated with a suspension of bleaching powder $(CaOCl_2)$ with water. The products are :

A. Etane and propane

B. Etyne and ethene

C. Trichloromethane and sodium accetate

D. Carbon tetrachloride

Answer: c

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100. 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

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101. 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

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102. Which of the following on reaction with chloroform will given chloretone ?

A. HNO_3

B. $(CH_3)_2C=O$

C. Chloral

D. $(CH_3)_2CHCHO$

Answer: b

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103. $C_6H_5Cl \xrightarrow{Ni-Al/NaOH} A$

In this reaction A is :

A. Phenol

B. Sodium phenoxide

C. Benzol

D. Benzene

Answer: d

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104. The sample of chloroform 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

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105. Which of the following is not an example of Sandmeryer's reaction?

A. $C_6H_5\overset{+}{N}_2Cl^- \xrightarrow{CuCl} C_6H_5Cl$

B. $C_6H_5\overset{+}{N}_2Cl^- \xrightarrow{CuBr} C_6H_5Br$

C. $C_6H_5\overset{+}{N}_2Cl^- \xrightarrow{CuCN} C_6H_5CN$

D. $C_6H_5\overset{+}{N}_2Cl^- \xrightarrow[Kl]{KCN} C_6H_5I$

Answer: d

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106. 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

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107. 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

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108. 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

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109. Identify C in the following series $C_3H_7I \xrightarrow[Alc]{KOH} A \xrightarrow[\Delta]{NBS} B \xrightarrow[Alc]{KCN} C.$

A. $(CH_3)_2CH - CN$

B. $CH_2 = CH - CH_2CN$

C. $Br - CH = CH - CN$

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

Answer: b

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110. Which of the following haldies has the least dipole moment?

A. $1, 2 -$ Dichlorobenzane

B. Dichloromethane4

C. Trichloromethane

D. Etyl chlororide

Answer: c

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111. The chemical reaction :

$(CH_3)_3CBr \xrightarrow[-H_2O,\,-KBr]{KOH\,(alc.)} (CH_3)_2C=CH_2$ is and example of

A. Nucelophilic substitution

B. Electrophilic substitution

C. Free radical substituion

D. $\beta-$ Elimination

Answer: d

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112. 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

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113. 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

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114. Which of the folliwng haldies can yield ethane and also methane in a single step?

A. C_2H_5Br

B. CH_2I

C. $(CH_3)_2CHBr$

D. None

Answer: b

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115. An alkyl halide with molecular formula, $C_6H_{13}Br$ on treatment with alcoholic KOH gave two isomeric alkenes, A and B. Reductive ozonolysis of the mixture gave the following compounds:

CH_3COCH_3, CH_3CHO, CH_3CH_2CHO and $(CH_3)_2CHCHO$

The alkyl halide is

A. $2-$ Bromohexane

B. $3-$ Bromo $-2-$ methylpentane

C. $2, 2-$ Dimethyl $-l$ bromonhexane

D. Unpredicatable

Answer: b

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116. 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

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117. Which of the following represents Freen?

A. Acetylene tetrachloride

B. Trichlorethylene

C. Dichlordifluoromethane

D. Ethylene dichloride

Answer: c

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118. 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

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119. 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

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120. 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

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121. Rascing's process is employed for the commerical preparation of:

A. Ehthyl chloride

B. Grignard's regent

C. Chlorobenzane

D. Ethanol

Answer: c

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122. Vinyl chloride and ethyl chloride can be distingushed by

A. Lucas reagent

B. KOH, $AgNO_3$

C. $AgCl$

D. $HCl / AgCl$

Answer: b

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123. The disillation of bleaching powder and acetone gives:

A. $CHCl_3$

B. Chloral

C. CH_3Cl

D. $\mathbb{C}l_4$

Answer: a

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124. Chlorination of methane proceeds by

A. Electrophilic substitution

B. Nucelophilic substitution

C. Free radical mechanism

D. None of these

Answer: c

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125. Aryl halides are less reactive towards nucleophilic substitution reactions 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

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126. How many chiral carbon atoms are present in $2.3,4-$ trichloropentane?

A. 3

B. 2

C. 1

D. 4

Answer: b

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127. Carbylamine test is performed in alcoholic 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

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128. What happens when CCI_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

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129. 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

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130. Slow oxidation of chloroform in air leads to

A. Formly chloride

B. Formic acid

C. $COCl_2$

D. Trichloro acetic acid

Answer: c

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131. The reaction of tertiary butyl bromide with sodium methoxide gives

A. Isobutane

B. Isobutylene

C. $t-$ Butyl methyl etiher

D. Sodium tert-butaoxide

Answer: b

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132. Which is most reactive towards Br_2 in the prsence of $FeBr_3$?

A. Anisole

B. Benzene

C. Bromolbenzene

D. Nitrobenzene

Answer: a

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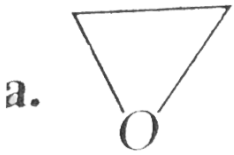
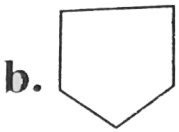
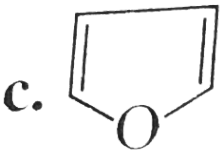
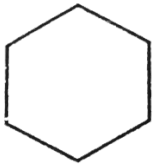
133. Which of following is most easily cleaved by HBr.

A. 

B. 

C. 

d. 

D.

Answer: a

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134. Which will react faster with NBS?

A. C_6H_6

B. CH_4

C. Toluene

D. Cyclorpropane

Answer: c

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135. 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

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136. 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

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137. The chemistry of benzene is characterised by which fo the following types of reaction?

A. Additomn

B. Elimination

C. Polymerisation

D. Substituion

Answer: d

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138. 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

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139. Which of the following deactivates the aromatic nucleas?

A. $-CH_3$

B. $-Br$

C. $-NH_2$

D. $-NR_2$

Answer: b

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140. The experimental determined rate equiaction for the alkaline hydrolysis of RBr is given by:

Rate $= K[RBr]\left[\overset{\theta}{O}H\right]$

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

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141. Which of the following undergoes nitration most easily?

A. Toluene

B. Styrene

C. Chlorobenzene

D. phenol

Answer: c

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142. 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

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143. Which of the following reagents on reaction with acetylene yield same product?

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

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

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

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

Answer: a

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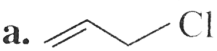
144. Which is least reactive towards nucleophilic substitution (S_{N^2})

A. a. 

B. $Me_3C - Cl$

C. $PhCl$

D. $MeCH(Cl)Me$

Answer: c

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145. Fluorobenzene (C_6H_5F) 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

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146. $CH_3Br + Nu^{\Theta} \rightarrow CH_3 - Nu + Br^{\Theta}$

The decreasing order of the rate of the above reaction with nucleophiles Nu^{Θ} A to D is-

$[N\bar{u} = (A)phO^-, (B)AcO^-, (C)H\overline{O}, (D)CH_3\overline{O}]$

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

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

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

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

Answer: c

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147. HBr reacts with $\overset{CH_2}{\underset{||}{C}}H - OCH_3$ 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

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148. 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

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149. 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

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150. Which of the follwing has the highest boiling point?

A. C_3H_7Cl

B. C_4H_9Cl

C. $CH_3CH(CH_3)CH_2Cl$

D. $(CH_3)_3C - Cl$

Answer: b

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151. Which of the following sequence of reactions (reagents) can be used for the 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

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152. 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

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153. Bottles containing C_6H_5I and $C_6H_5CH_2I$ lost their original labels. They were labelled A and B for testing. A and B were separately taken in

test tubes and boiled with NaOH solution. The end solution in each tube was made acidic with dilute HNO_3 and some $AgNO_3$ solution added. Solution B gave a yellow precipitate. Which one of the following statements is true for the experiment?

A. Addition of HNO_3 was unnecessary

B. (A) was PhI

C. (A) was $PhCH_2I$

D. (B) was Phl

Answer: b

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154. One mole of 1,2-dibromopropane on treatment with X moles off $NaNH_2$ followed by treatment with ethyl bromide gave a 2-pentyne. The value of X is

A. 1

B. 2

C. 3

D. 4

Answer: c

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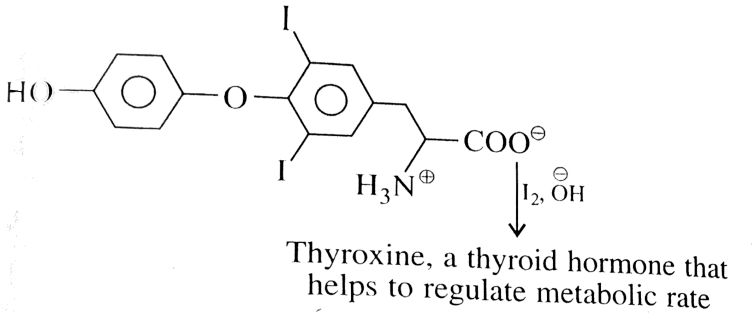
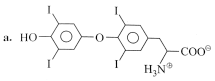
Exercises Single Correct Answer Type

1. In the reaction is:



Thyoxine is:

A. 

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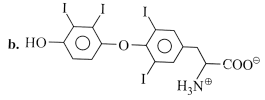

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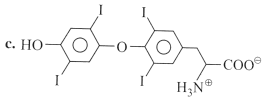

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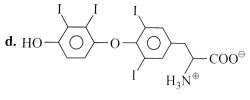

Answer: b

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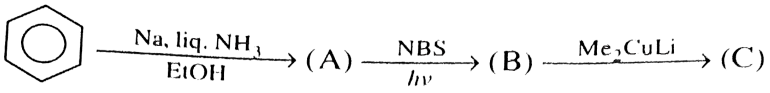
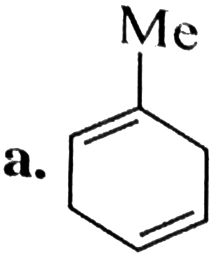
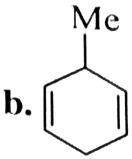
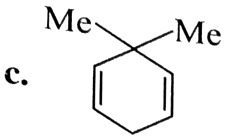
2. The final product (C) in the follwing reactions is:

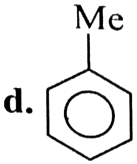


A.



B. 

C. 

D. 

Answer: b

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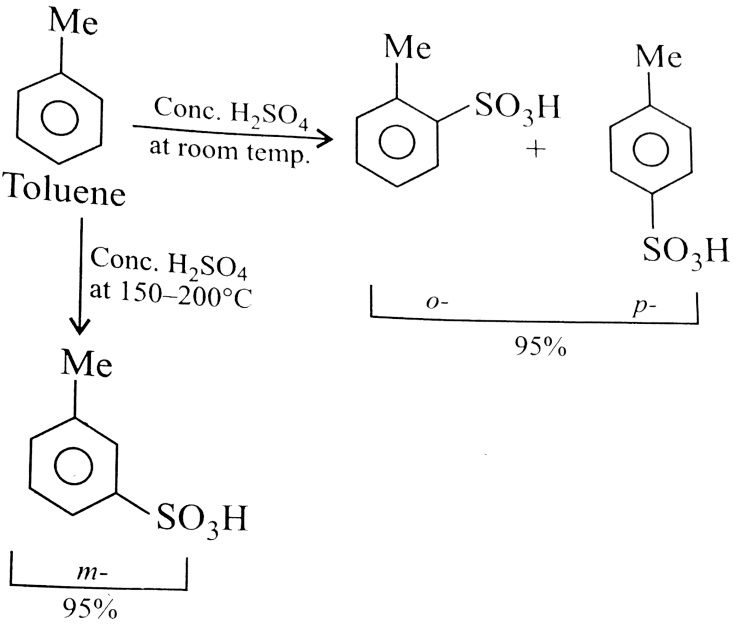

3.

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

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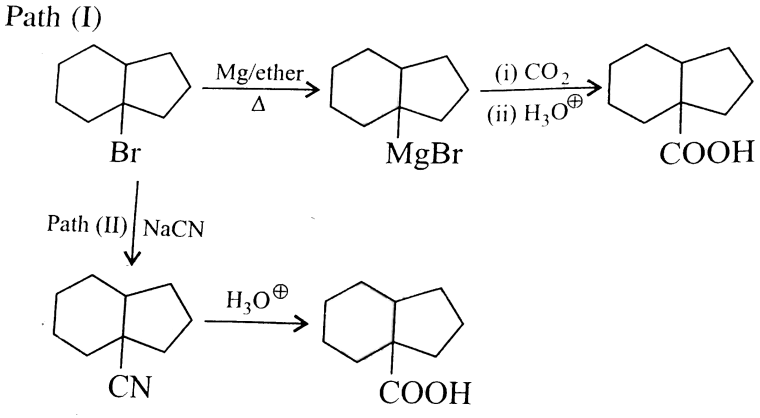
4. In the following reaction, the final product can be prepared by two paths (I) and (II).

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

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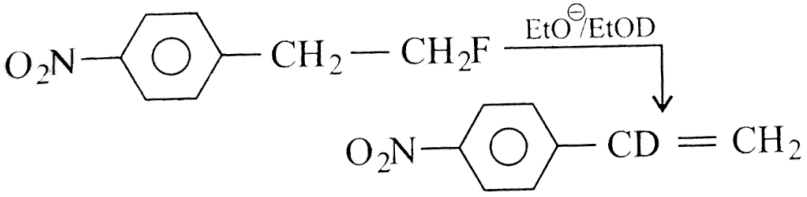
5.



By which mechanism does the reaction proceed?

A. $E1$

B. $E2$

C. $ElcB$

D. $\beta -$ Elimination

Answer: c

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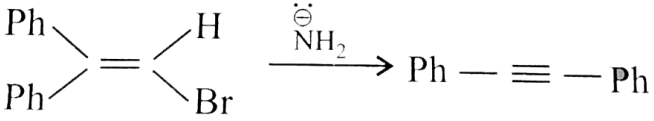
6. 

Which of the folloiwng statements is correct about the above reaction?

A. The reaction proceeds by $\alpha -$ elimination via the formation of a carbene as an intermediate.

B. The reaction proceeds by $\alpha -$ elimination via the formation fo a carbonion as an intermidiate.

C. The reaction proceeds via $E1$ mechanism.

D. The reaction $ElcB$ mechanism.

Answer: a

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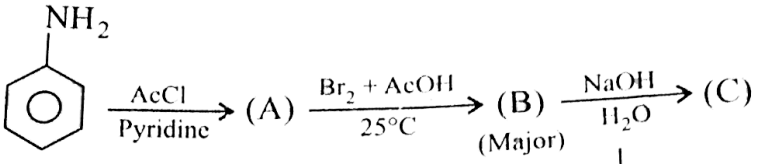
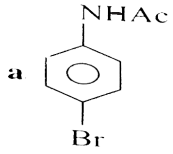
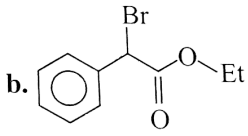
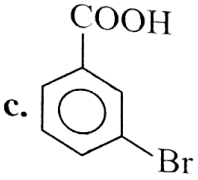


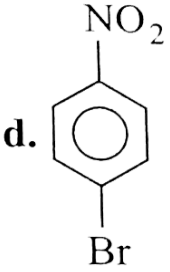
7.

(D) would be:

A. 

B. 

C. 

D. 

Answer: d

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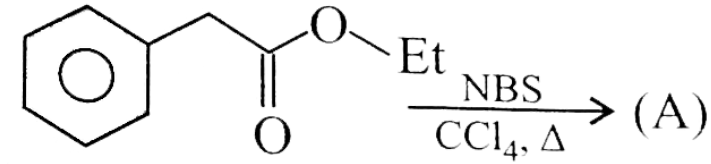
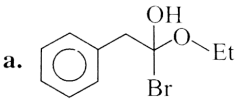
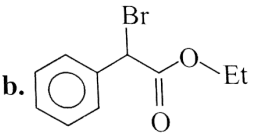


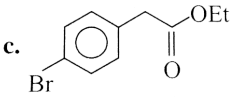
(A) would be:

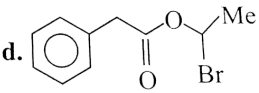
8.

(A) would be:

A. a. 

B. b. 

C. c. 

D. d. 

Answer: b

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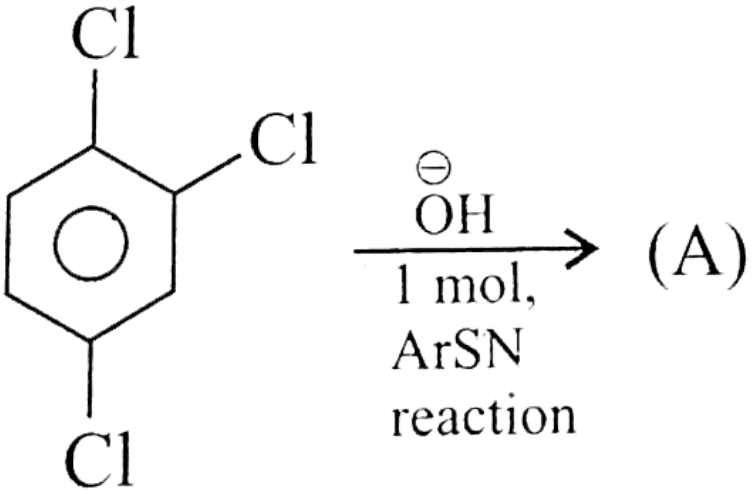
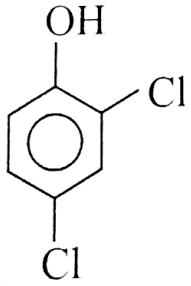
9.



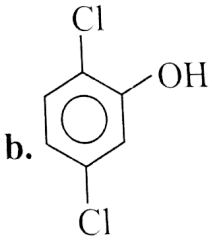
(A) would be:

A.

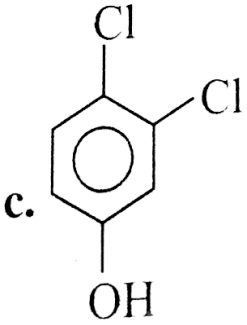
a.



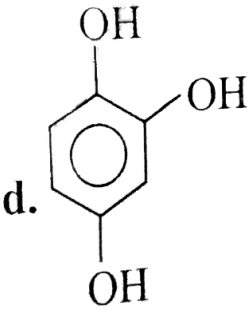
B.



C.



D.



Answer: a

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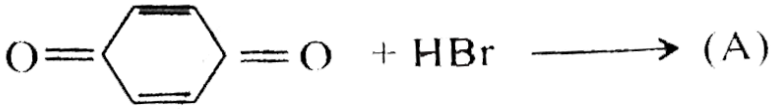
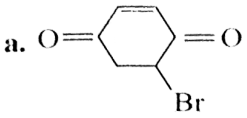
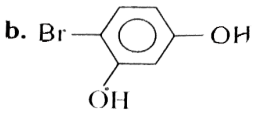
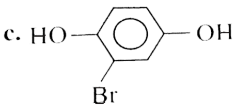
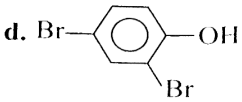
10. 

`(A) would be:

A. 

B. 

C. 

D. 

Answer: *c*

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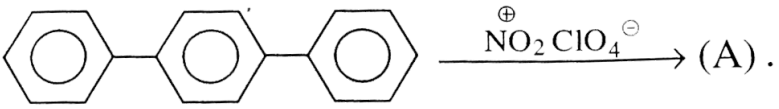
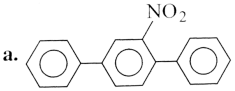
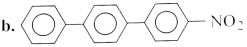
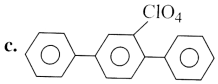
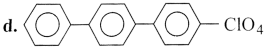
11. 

`(A) would be:

A. 

B. 

C. 

D. 

Answer: a

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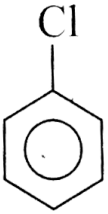
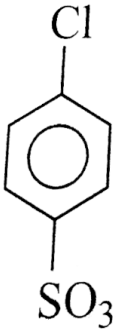
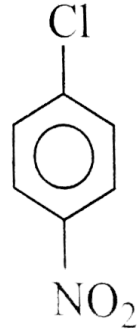
12. The drecresing order of $ArSN$ reaction with $C_2H_5O^{o-}/ErOH$ is:

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

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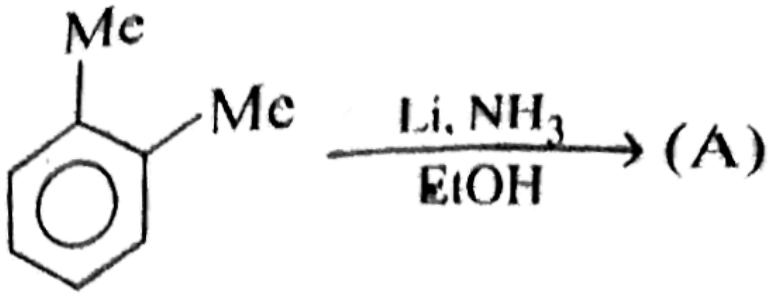
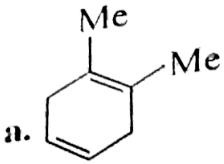
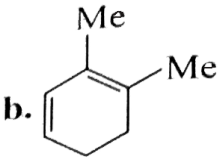
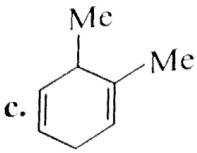
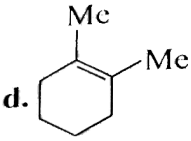
13. 

`(A) would be:

A. a. 

B. b. 

C. c. 

D. d. 

Answer: a

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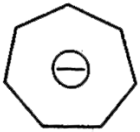
14. Which of the folloiwng is the correct order of stablitly of the given compounds?

I. 

II. 

III. 

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

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

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

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

Answer: a

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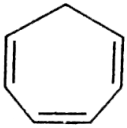
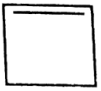
15. Give the decreasing order of K_a value of the following compounds.

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

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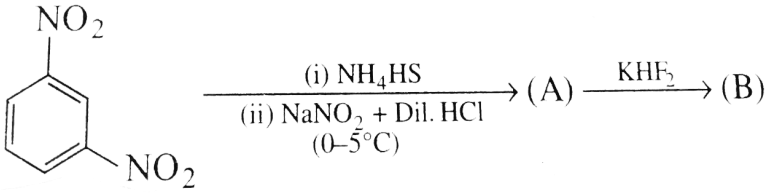
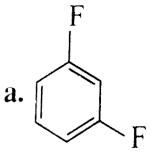
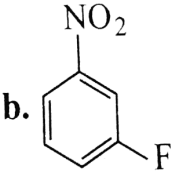
16. What is the end product of the reaction?



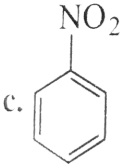
A.



B.



C.



D.

Answer: *b*

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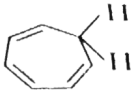
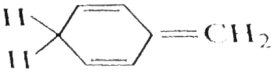
17. Give the increasing order of pK_a value of the folliwng compounds?

I. C_9H_{10} II.  III. 

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

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

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

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

Answer: a

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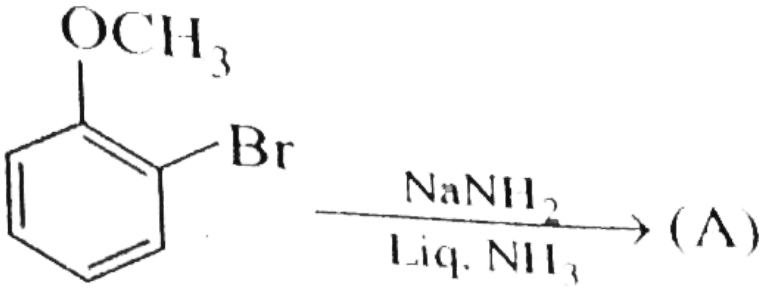
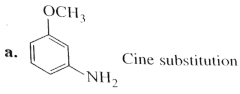
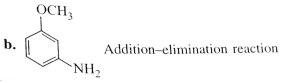
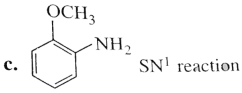
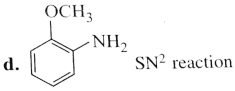
18. 

The major product (A) and reaction (R) are:

A. 

B. 

C. 

D. 

Answer: a

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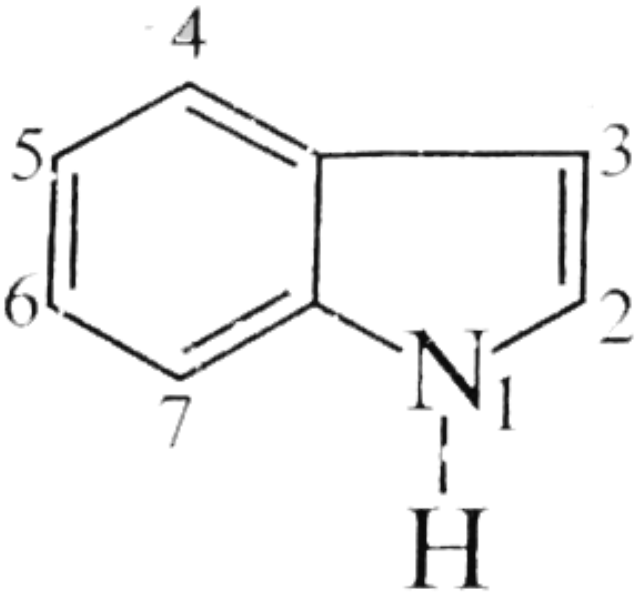
19. Which of the following metioned positons in the given compound is more reactive towards electrophilic substituations?



A. 3

B. 2

C. 5

D. 6

Answer: a

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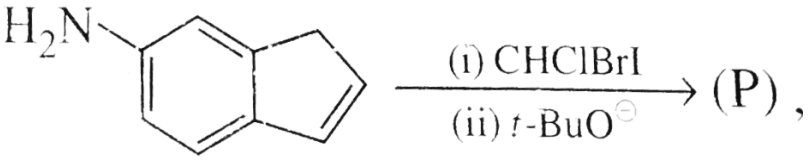
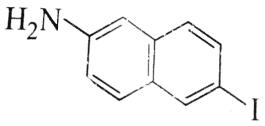
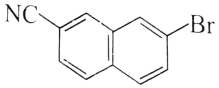
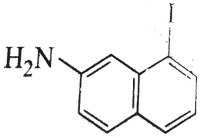
20. In the reaction is

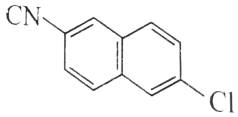


Product (P) wil be:

A. 

B. b. 

C. c. 

D. d. 

Answer: d

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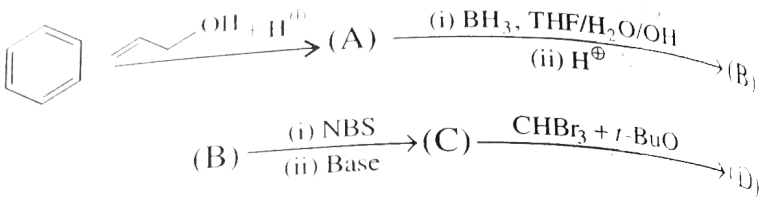
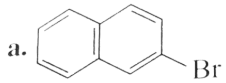
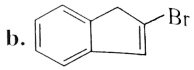
21. What is the end product (D) of the following reaction?



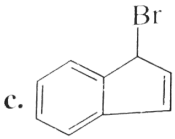
A.



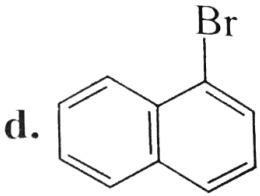
B.



C.



D.



Answer: a

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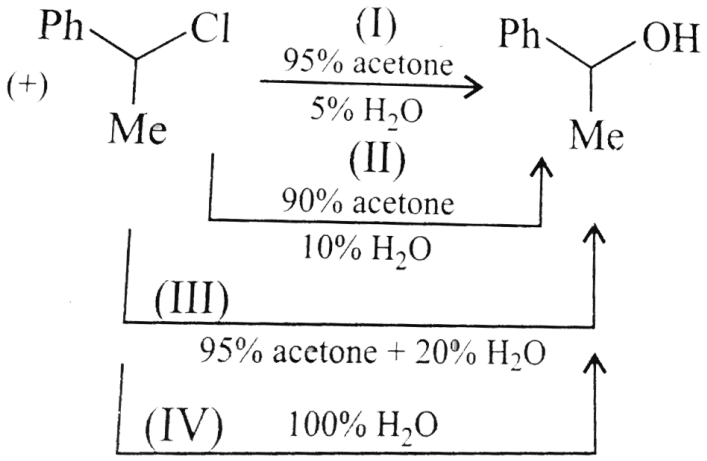
22. Consider the follwing reactions:



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

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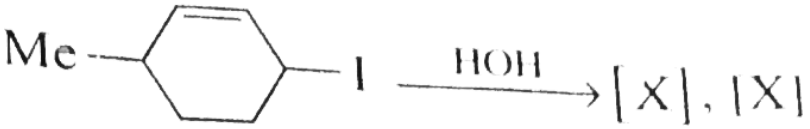
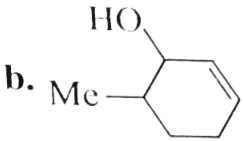
23. In the reaction

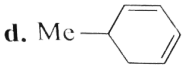


will be:

A. 

B. 

C. Both (a) and (b)

D. 

Answer: a

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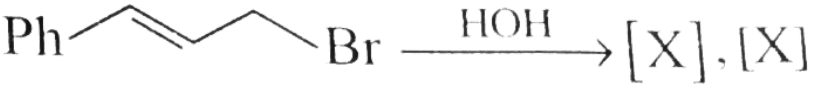
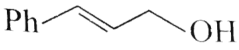
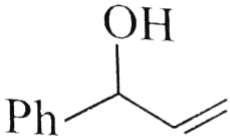
24. In the reaction

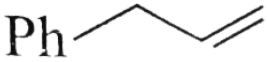


will be:

A. 

B. 

C. Equimolar mixture of (a) and (b)

D. 

Answer: *c*

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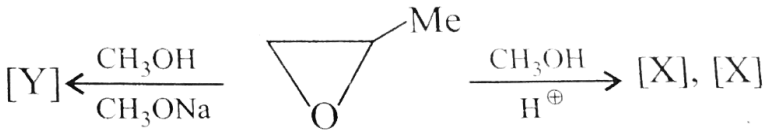
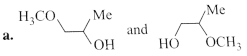
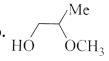
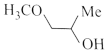
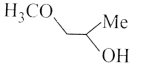
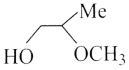
25.  are:

A. a.  and

B. b.  and 

C. c.  in both cases

D. d.  in both cases

Answer: b

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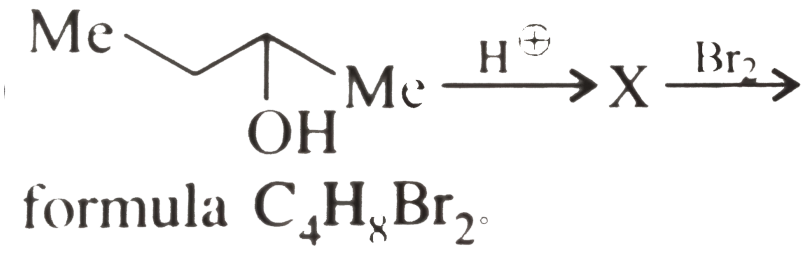
26. 

Find compound with formula $C_4H_8Br_2$

How many structure of (X) are possible?

A. 2

B. 3

C. 4

D. 5

Answer: b

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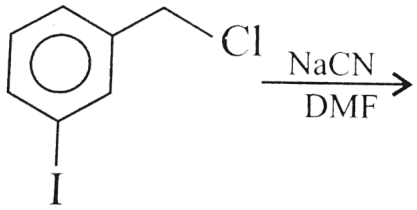
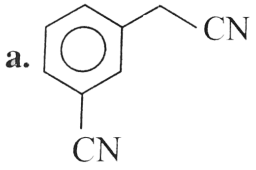
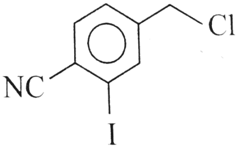
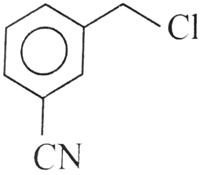
27. The sturcture of the major product formed in the following reaction is:

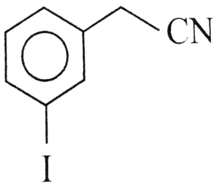


A. a.



B. b. 

C. c. 

D. d. 

Answer: d

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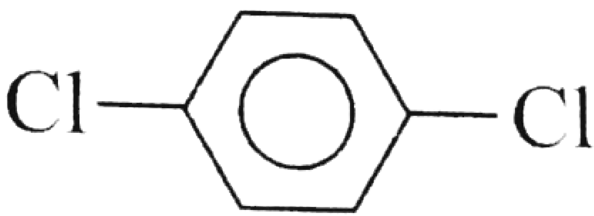
28. Consider the follwing halogen containing compounsds:

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

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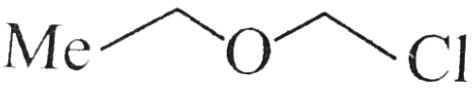
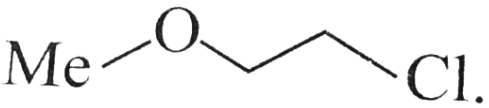
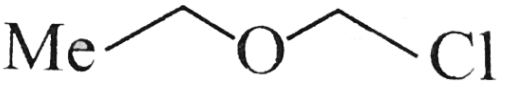
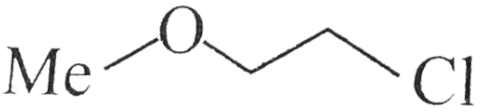
Exercises Assertion-Resoning Type

1. Assertion (A):  reacts faster with H_2O than 

Reason `(R): The carbocation of  is more stable 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. $(A) is true but$(R)` is false.

D. $(A) is false but$(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 reaction is carried out in the presence of polar aprotic solvent.

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

Watch Video Solution

3. Assertion (A): Reaction between (Me_3CONa) (sodium ter-butoxide) and ethyliode (C_2H_5I) 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

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4. Assertion : Benzyl bromide when kept in acetone water it produces benzyle alcohol.

Reason : The reaction follows S_N2 machanism

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

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5. Assertion : Hydroxyketones are not directly used in Grianard reaction.

Reason : Grignard reagents reacts 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. $(A) is true but$(R)` is false.

D. $(A) is false but$(R)` is true.

Answer: a

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6. Assertion:2-Bromobutane on reaction with sodium ethoxide in ethanol gives 1-butene as a major product

Reason:1-butene is more stable 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. $(A) is true but$(R)` is false.

D. Both (A) and (R) are false.

Answer: d

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7. Assertion : The presence of nitro group facilitates nucleophilic substiution reactions in aryl halides. Reason : The intermediate carbanion is stabilised due to the presence of 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

Watch Video Solution

8. 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

Watch Video Solution

9. Assertion (A) In cpmparison to ethyl chloride , it is not easy to carry out nucleophilic substitution on vinyl chloride.

Reason (R) Vinyl group is an 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. $(A) is true but$(R)` is false.

D. $(A) is false but$(R)` is true.

Answer: c

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10. Assertion (A): $PhBr$ is less reactive than C_2H_5Br towards SN reactions.

Reason (R): The forces of attraction between RX and H_2O molecules are weaker than those present between the molecules of RX and water molecules separately

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

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11. Assertion (A) tert-butyl bromide undergoes Wurtz reaction to give 2,2,3,3-tetramethylbutane.

Reason (R) In wurtz reaction, alkyl halides react with sodium in dry ether

to give hydrocarbon containing double the number of carbon atoms present in the 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. $(A)istruebut$(R)` is false.

D. Both (A) and (R) are false.

Answer: d

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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

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2. The reaction of toluene with chlorine in presence of ferric chloride gives predominantly :

A. Benzoyl chloride

B. $m-$ Chlorotoluene

C. Benzyl chloride

D. $o-$ and $p-$ Chlorotoluene

Answer: d

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3. In the reaction of p-chlorotoluene with KNH_2 is liquid NH_3 the major product is .

A. $o-$ Toluidine

B. $m-$ Toluidine

C. $p-$ Toluidine

D. $p-$ Chloronailine

Answer: b

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4. Benzylchloride $(C_6H_5CH_2Cl)$ can be prepared from toluene by chlorination with :

A. SO_2Cl_2

B. $SOCl_2$

C. Cl_2

D. $NaOCl$

Answer: c

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5. A solution of (+)-1-chloro-1-phenylethane in toluene racemises slowly in the presence of a small amount of $SbCl_5$ due to the formation of

A. Carbanion

B. Carbene

C. Free radical

D. Carbocation

Answer: d

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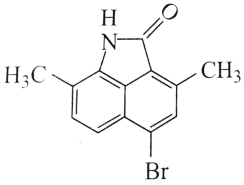
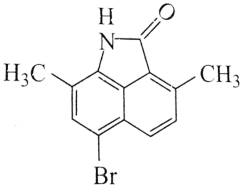
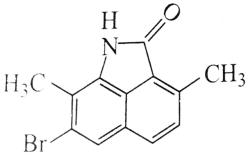
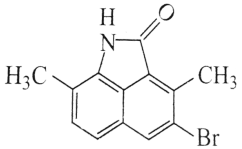
6.

product on monobromination of this compound is

A. 

B. 

C. 

D. d. 

Answer: b

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7. Which of the following is soluble in water

A. CS_2

B. C_2H_5OH

C. CCl_4

D. $CHCl_3$

Answer: b

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8. Phenol when treated with excess of bromine water gives a white precipitate of

A. $m-$ Bromophenol

B. $o-$ and $p-$ bromophenol

C. $2, 4-$ Dibromophenol

D. $2, 4, 6 -$ Tribromophenol

Answer: d

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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

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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

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11. n-propyl bromide on treatment with ethanolic potassium hydroxide produce

A. Propane

B. Propene

C. Porpyne

D. Propanol

Answer: b

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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

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13. Monochlorination of toluene in sunlight followed by hydrolysis with aq. NaOH yields

A. $o-$ Cresik

B. $p-$ Cresol

C. `2,4- Dihydroxy toulene

D. Benzoic acid

Answer: d

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14. $1-$ Chlorobutane on reaction with alcoholic potash gives:

A. $1-$ Butene

B. $1-$ Butanol

C. $2-$ Butene

D. $2-$ Butanol

Answer: a

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15. Among the following compounds , the strongest acid is:

A. $HC = CH$

B. C_6 H_(6)`

C. C_2H_6

D. CH_3OH

Answer: d

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16. The order of reactivities of the following alkyl halides for an S_{N^2} reaction is:

$RF > RCI > RBr > Rl$

$RF > RBr > RCl > Rl$

$RCl > RBr > rF > Rl$

$Rl > RBr > RF$

A. $RF > RCl > RBr > RI$

B. $RF > RBr > RCI > RI$

C. $RCl > RBr > RF > RI$

D. $RI > RBr > RCI > RF$

Answer: d

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17. The compound that will react most readily with NaOH to form methanol is :

A. $(CH_3)_4\overset{\oplus}{N}I^{\theta}$

B. CH_3OCH_3

C. $(CH_3)_3S^{\oplus}I^{\theta}$

D. $(CH_3)_3Cl$

Answer: a

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18. Identify the set of reagents/ reaction condition 'X' and 'Y' in the following set of transformations :

$$CH_3 - CH_2 - CH_2Br \xrightarrow{X} \text{Product} \xrightarrow{Y} CH_3 - \underset{\underset{Br}{|}}{CH} - CH_3$$

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

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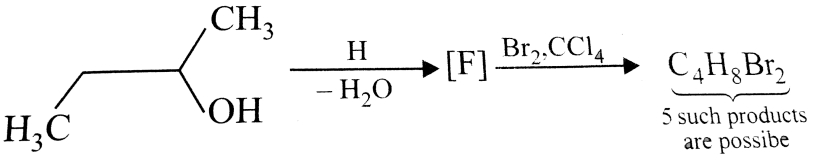
19. How many structures for F are possible



A. 2

B. 5

C. 6

D. 3

Answer: d

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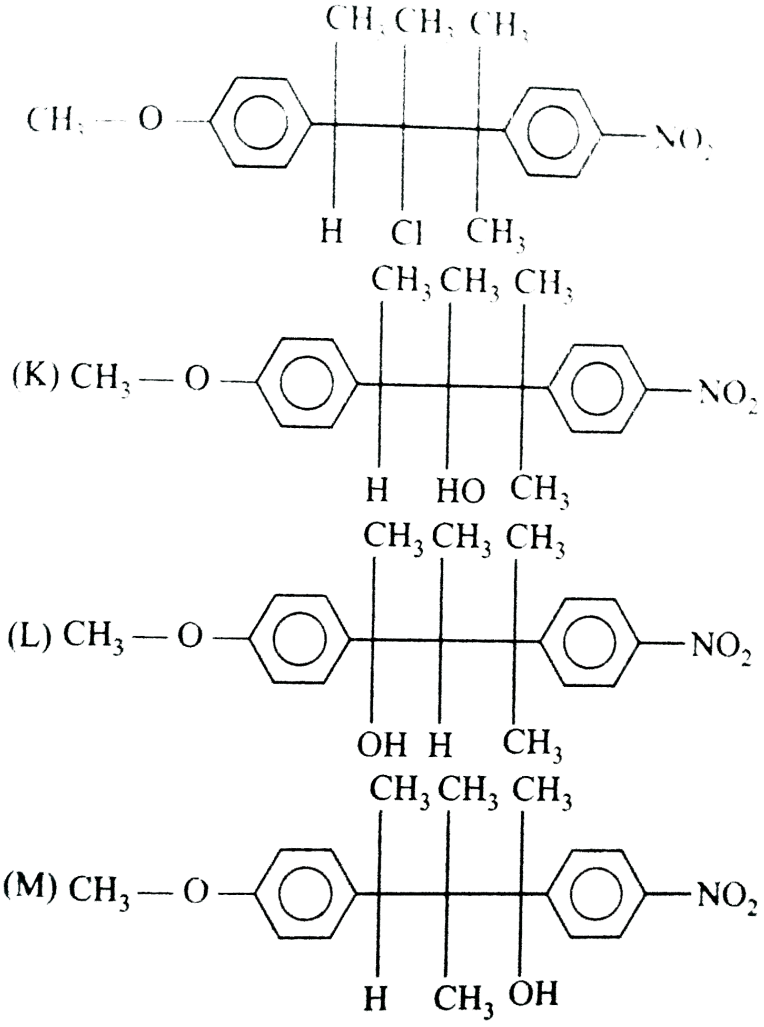
20. The following compound on hydrolysis in equeous acetone will give .



A. Mixture of (K) and (L)

B. Mixture of (K) and (M)

C. Only (M)

D. Only (K)

Answer: a

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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

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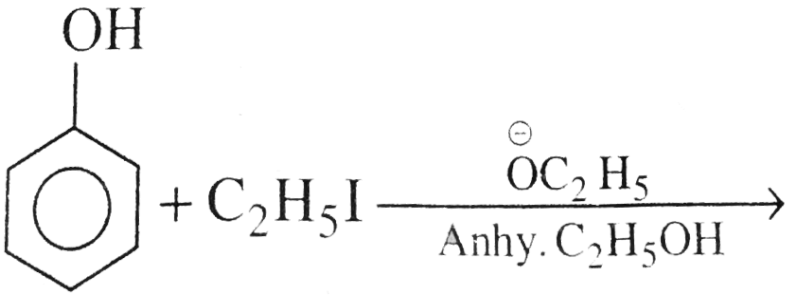
Archives Single Correct Answer Type



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

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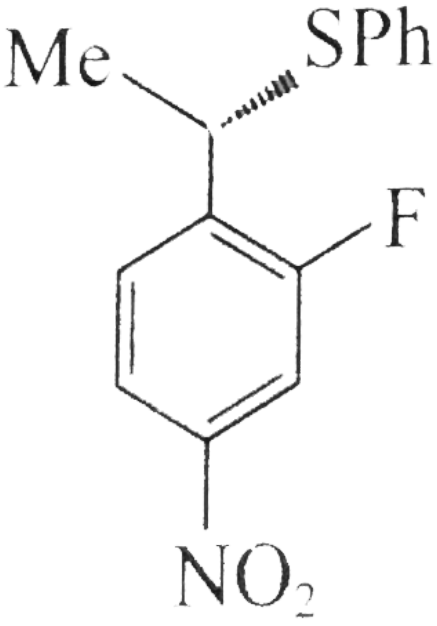
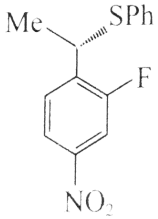
2. The major product of the following reaction is"

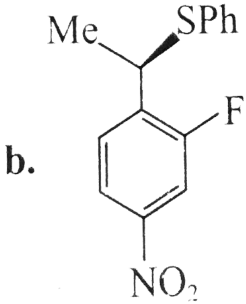
a.

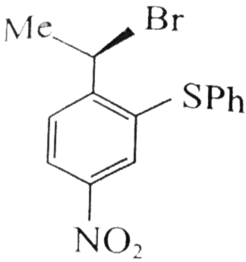


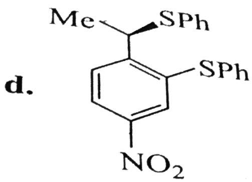
a.



A.

B. 

C. 

D. 

Answer: a

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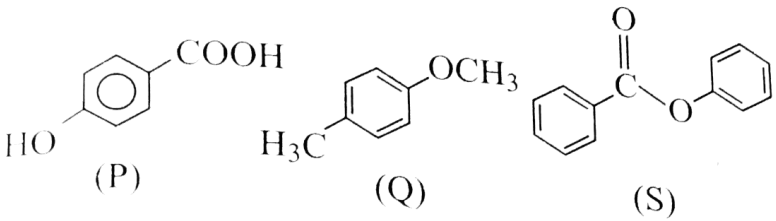
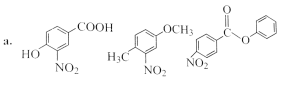
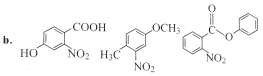
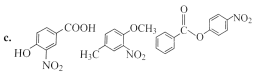
3. Compounds (P), (Q) and (S)

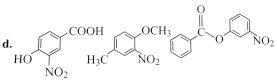


were separetly subjected to nitration using HNO_3 / H_2SO_4 mixture. The major product formed in each case, respectively is:

A. 

B. 

C. 

D. 

Answer: c

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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)

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2. Toluene, when treated with Br_2Fe, gives o and p-bromotoluene, 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)

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3. Aryl halides are less reactive towards nucleophilic substitution reactions as compared to alkyl 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)

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4. The compounds used as refrant are:

A. NH_3

B. CCl_4

C. CF_4

D. CF_2Cl_2

Answer: (a, d)

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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)`

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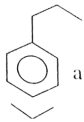
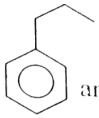
Archives Mutiple Correct Answers Type

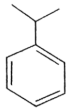
1.  $+ ClCH_2CH_2CH_3 \xrightarrow{AlCl_3}$

$$(P) \xrightarrow[(ii)\ H_3O^+]{(i)\ O_2\ /\ \Delta} (Q) + \text{Phenol}$$

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

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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.....

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2. The halogen which is most reactive , in the halogenation of alkanes under sunlight is .....

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3. The starting material for the manufacture of polyvinyl chloride is obtained by reacting HCl with .....

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4. Formation of phenol from chlorobenzene is an example of

.... Aromatic substitution.

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5. In benzene, carbon uses all the three p-orbitals for hybridisation .

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6. True or False?

An electron donating substituent in benzene orients the incoming electrophilic group to the meta-position.

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7. Carbon tetrachloride burns in air when lighted to give phosgene gas.

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8. The yield of ketone when a secondary alcohol is oxidised is more than the yeild of aldehyde when a primary alcohol is oxidised.

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9. Carbon tetrachloride is inflammable.(True/False)

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10. Assertion (A) Ethanol is a weaker acid than phenol.

Reason (R) Sodium ethoxide may be prepared by the reaction of ethanol with aqueous NaOH.

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11. The reaction of vinyl chloride with hydrogen iodide to give 1-chloro-1-iodoethane is an example of anti-Markownikoff's rule.

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12. State whether each of the following is true or false.

a. Photobromination of 2-methylpropane gives a mixture of 1-bromo-2-methylpropane gives a mixture of 1-bromo-2-methylpropane and 2-bromo-2-methylpropa ne in the ratio $9:1$

b. The percentage of n-propyl chloride obtained in the chlorination of propane is about 56%.

c. The percentage of 1-chloro-2-methylpropane obtained in the chlorination of isobutane is about 64%.

d. The percentage of n-propyl bromide in the bromination of propane is 44%. The relative reactives of 3°, 2° and 1° H atoms are $1600:82:1$.

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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.

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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.

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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.

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Archives Subjective

1. Although benzene is highly unsaturated it does not undergo addition reactions. The explanation of this can be suggested as

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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'.

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3. How many sigma and pi bonds are present in a benzene molecule?

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4. Write down the main product of the following reaction

$$\text{Benzene} \xrightarrow{CH_3CH_2COCl/AlCl_3}$$

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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?

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6. Arrange the following in increasing order of reactivity towards sulphonation with fuming sulphuric acid.

Benzene, toluene, methoxy benzene, chlorobenzene.

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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 $(C_6H_5 - C_6H_5)$ is more reactive than benzene towards electrophilic substitution.

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8. Product the major product in the following reactions:

i. $C_6H_6 + (CH_3)_2CHCH_2OH \xrightarrow{H_2SO_4} \ldots$

ii. $C_6H_5C_2H_5 \xrightarrow[(ii)\,NaCN]{(i)\,Br_2 \text{heat light}} \ldots.$

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9. Predict the structure of the intermediates/products in the following reaction sequences

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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.

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11. Give reasons for the following in one or two sentences "Nitrobenzene does not undergo Friedel-Craft's alkylation."

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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.

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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.

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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.

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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 (C_2Cl_6) from calcium carbide.

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16. Chloroform is kept in dark coloured bottles because

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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).

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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.

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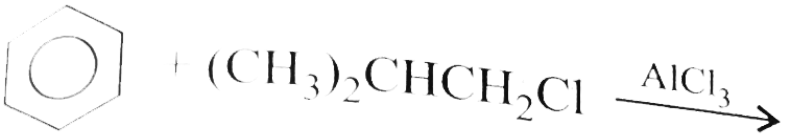
Archives Subjective Type

1. Write the structure of the major organic product expected form the following reaction:



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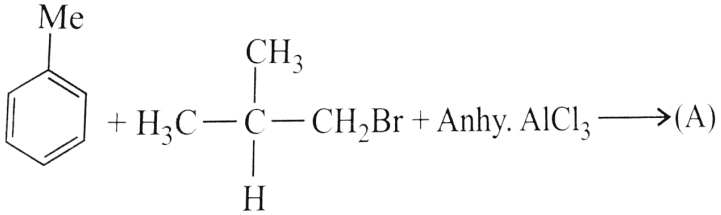
2. Complete the following giving sturctures of the principle organic products.



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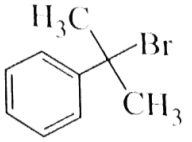
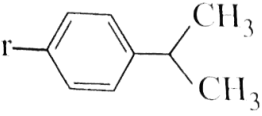
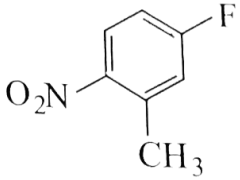
3. Give reasons for the following:

a. i. 

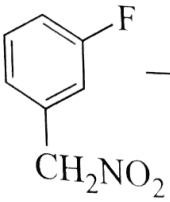
$\xrightarrow{C_2H_5OH\ (aq.)}$ Acidic solution

ii. 

$\xrightarrow{C_2H_5OH\ (aq.)}$ Neutral

b. i. 

$\xrightarrow{NaOH\ (aq.)}$ $F^{\ominus}$ (Liberated)

ii. 

$\xrightarrow{NaOH}$ $F^{\ominus}$ is not liberated.

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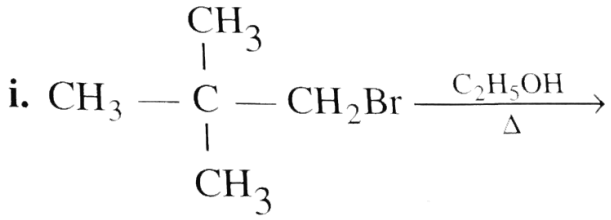
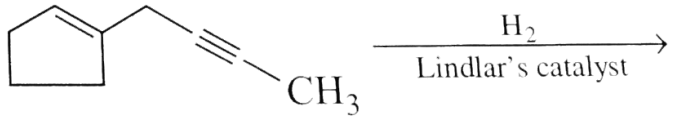
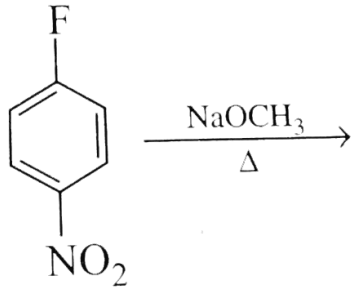
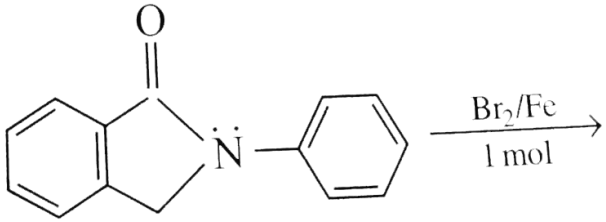
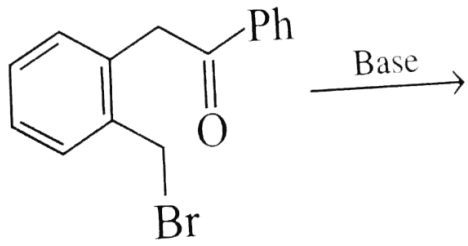
4. What woule be the major product in each of the following reactions?

i. 

ii. 

iii. 

iv. 

v. 

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