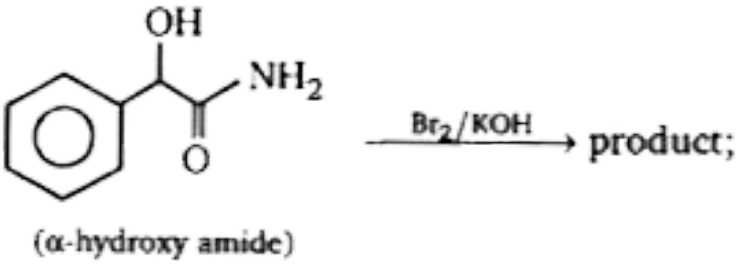
CHEMISTRY

BOOKS - MS CHOUHAN

CARBENE AND NITRENE

Level 1

1. 

(α-hydroxy amide)

Product of this Hoffmann bromamide reaction is :

A. $Ph - \overset{\overset{O}{||}}{C} - CH_3$

B. $Ph - CHO$

C. $Ph - CH - OH$

D. $Ph - CH_2 - NH_2$

Answer: B

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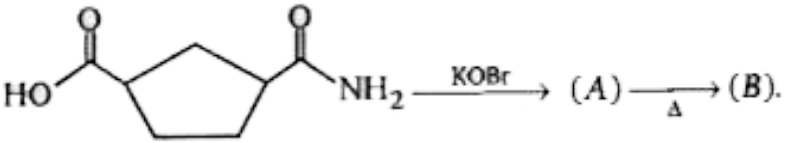
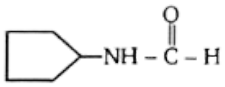
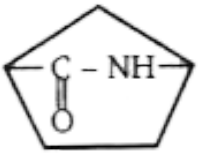
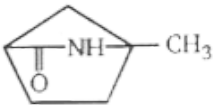
2.



Compmound (B) is :

A. 

B. 

C. 

D.

Answer: B

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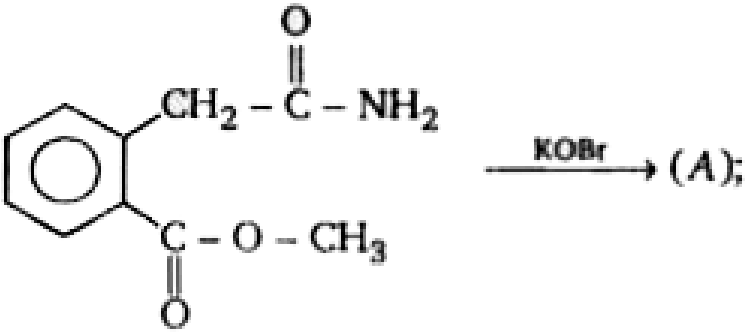
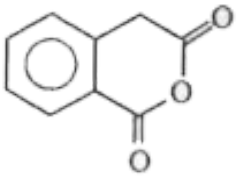
3.



Product (A) is :

A.



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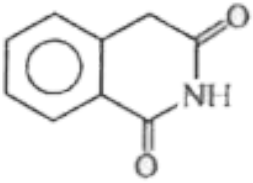

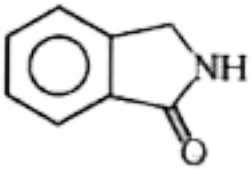

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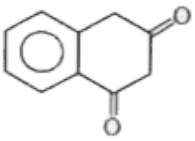

D.

Answer: C

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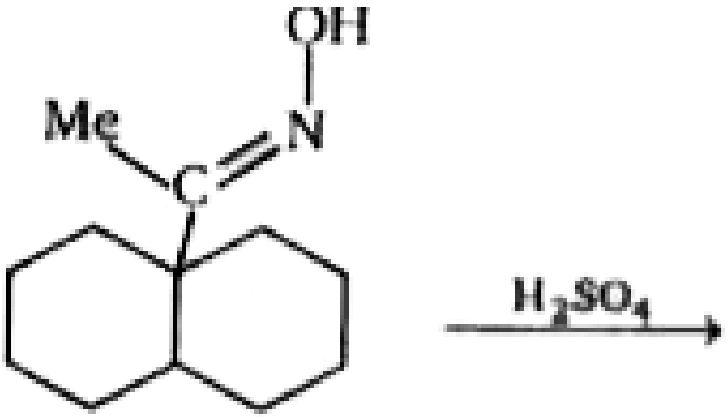
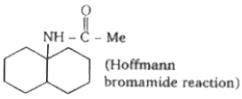
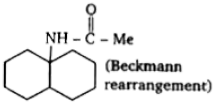
4.

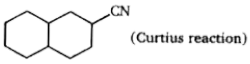


Product

and name of the reactions is :

A. 

B. 

C. 

D. None of these

Answer: B

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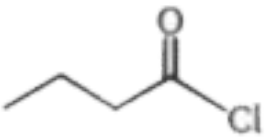
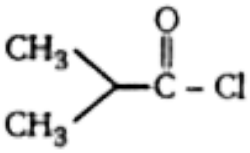
5. $(X)C_4H_7OCl \xrightarrow{NH_3} C_4H_9ON \xrightarrow[KOH]{Br_2} CH_3CH_2CH_2NH_2$, Compound (X) is :

A. 

B. 

C. 

D. 

Answer: A

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6. Which of the following will not give Hoffmann bromamide reaction?

A. $CH_3 - \overset{O}{\overset{||}{C}} - NH_2$

B. $Ph - \overset{O}{\overset{||}{C}} - NH_2$

C. $CH_3 - \overset{O}{\overset{||}{C}} - NH - Br$

D. $Ph - \overset{\overset{O}{||}}{C} - NH - Ph$

Answer: D

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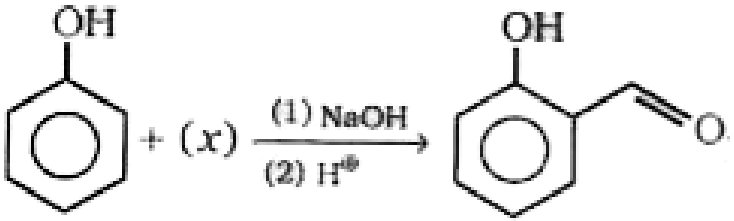
7. 

, Reactant x is :

A. CH_3Cl

B. CH_2Cl_2

C. $CHCl_3$

D. CCl_4

Answer: C

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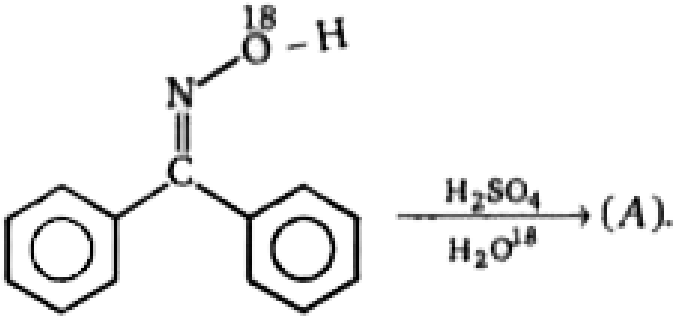

8. Product (A) of the reaction is:

A. $Ph - NH - \overset{\overset{O}{||}}{C} - Ph$

B. $Ph - NH - \overset{\overset{O^{18}}{||}}{C} - Ph$

C. $(Ph)_2 - \overset{\overset{OH}{|}}{C} - NH_2$

D. $Ph - CH_2 - NH - Ph$

Answer: B

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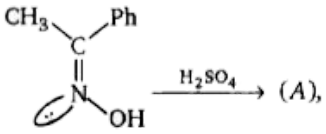
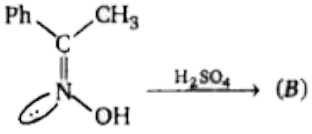
9.  (A),  (B)

Product (A) & (B) respectively in the above reaction are :

A. $Ph-\overset{\overset{O}{||}}{C}-NH-CH_3, Ph-\overset{\overset{O}{||}}{C}-NH-CH_3$

B. $CH_3-\overset{\overset{O}{||}}{C}-NH-Ph, CH_3-\overset{\overset{O}{||}}{C}-NH-Ph$

C. $Ph-\overset{\overset{O}{||}}{C}-NH-CH_3, CH_3-\overset{\overset{O}{||}}{C}-NH-Ph$

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

Answer: C

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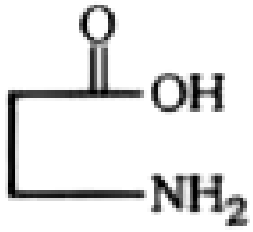
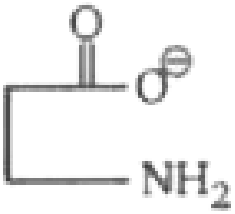
10. $NBS \xrightarrow{KOBr} (A)$. Product (A) is :

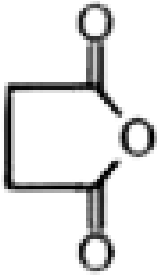
A.



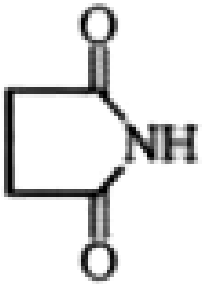
B.



C.



D.



Answer: B

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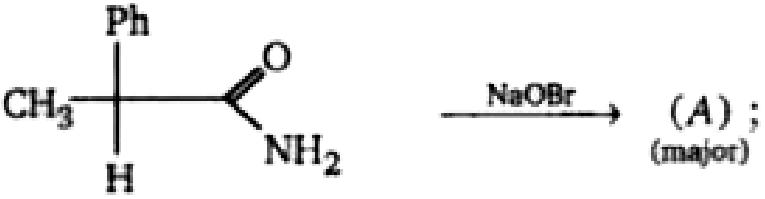
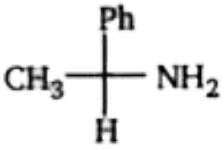
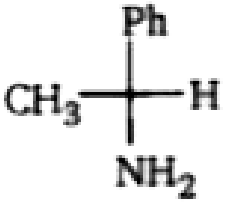
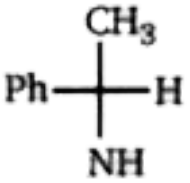
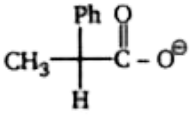
11. 

Product of the reaction is :

A. 

B. 

C. 

D. 

Answer: A

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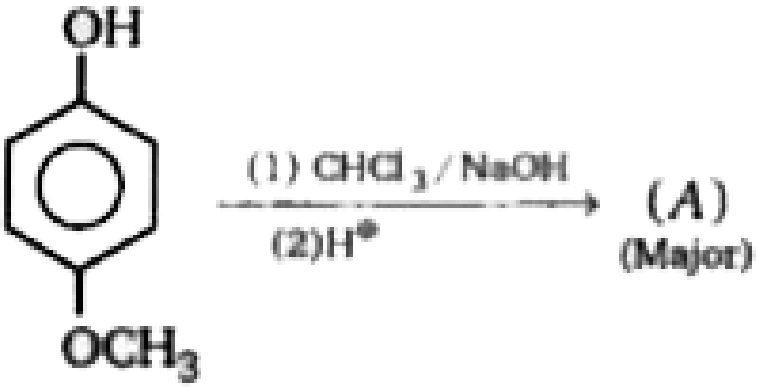
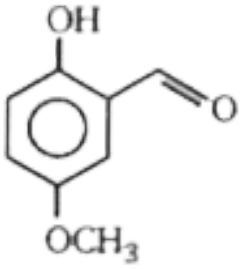
12.

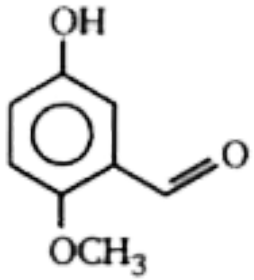


Product (A) is:

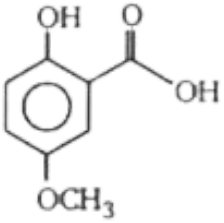
A.



B.



C.



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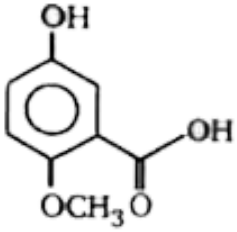

Answer: A

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13.

$$R-\overset{\overset{O}{||}}{C}-NH_2+xNaOH+Br_2\rightarrow R-NH_2+2NaBr+Na_2CO_3+H$$

Number of moles of NaOH used in above Hoffmann bromamide reaction is :

A. 3

B. 4

C. 5

D. 6

Answer: B

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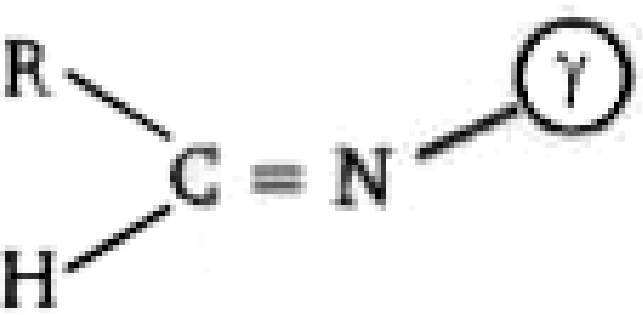
14. 

, Rate of reaction toward Backmann rearrangement

when $\gamma = \underset{(i)}{CH_3CO_2^-}, \underset{(ii)}{Cl - CH_2 - CO_2^-}, \underset{(iii)}{Ph - SO_3^-}$

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

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

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

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

Answer: C

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15. When primary amine reacts with chloroform in ethanolic KOH, then product is :

A. an isocyanide

B. an aldehyde

C. a cyanide

D. an alcohol

Answer: A

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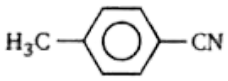
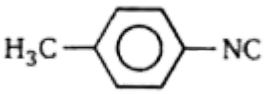
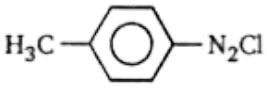
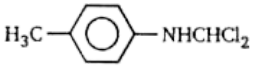
16. The reaction of chloroform with alcoholic KOH and p-toluidine forms :

A. 

B. 

C. 

D. 

Answer: B

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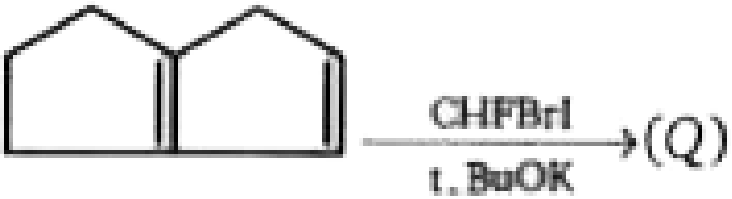
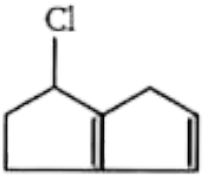
17. What is the product (Q) of the following reaction?



A. 

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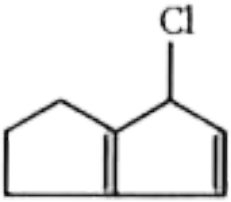
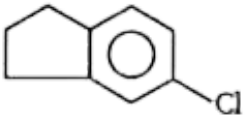


C.



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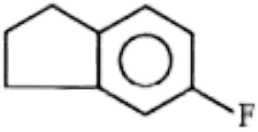

Answer: D

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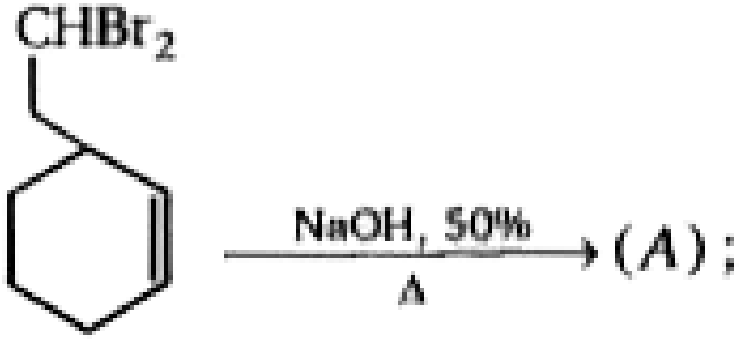

18. , Product (A) is :

A.

B.

C.

D. 

Answer: A

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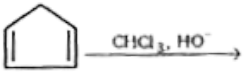
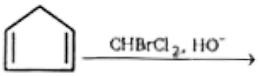
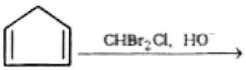
19. Which of the following reaction, does not give chloro benzene as a product?

A. 

B. 

C. 

D. 

Answer: D

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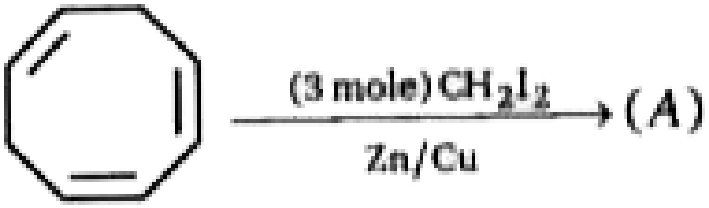
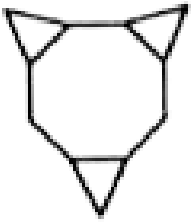


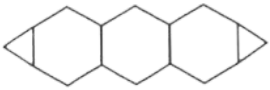
20.

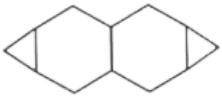
Compound (A) is :

A.



B.

C. 

D. 

Answer: A

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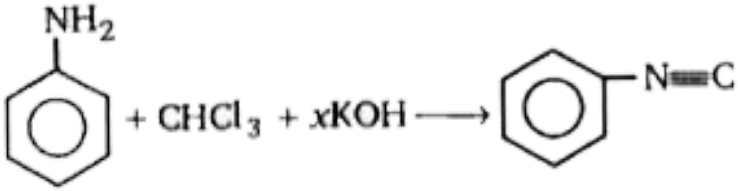
21. 

x = moles of KOH consumed is :

A. 1

B. 2

C. 3

D. 4

Answer: C

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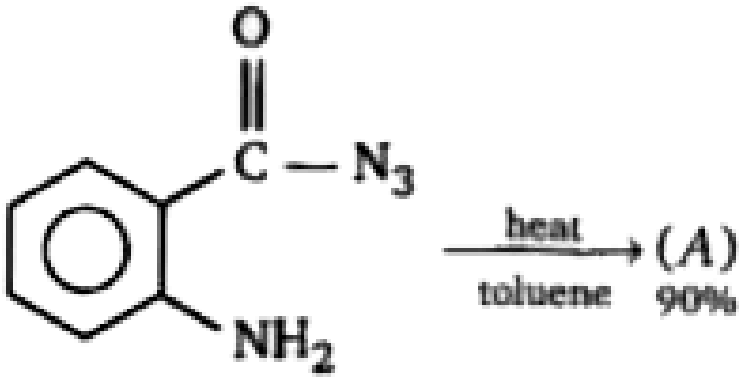
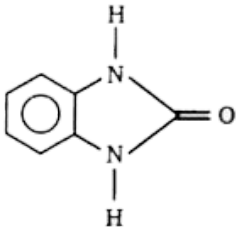
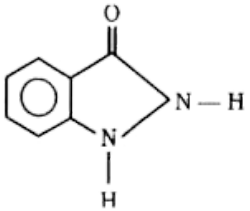
22. Heating the acyl azide in dry toluene under reflux for 3-hours give a 90% yield for a heterocyclic product. Identify the product (A).



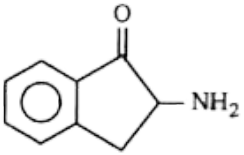
A.



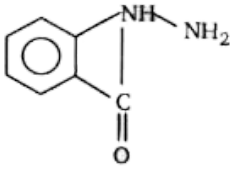
B.



C.

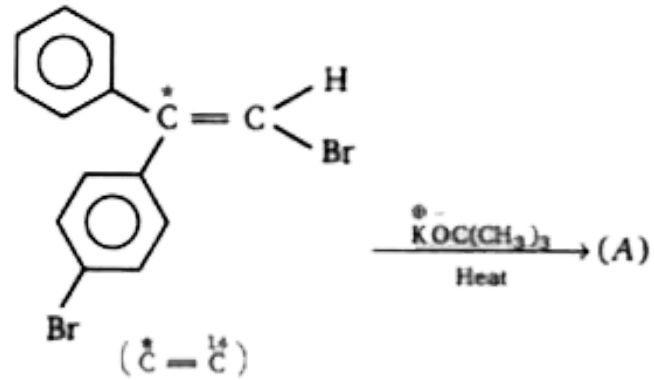


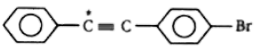
D.

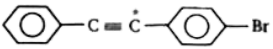


Answer: A

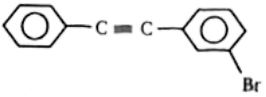
Watch Video Solution

23. 

A. 

B. 

C. 

D. 

Answer: B

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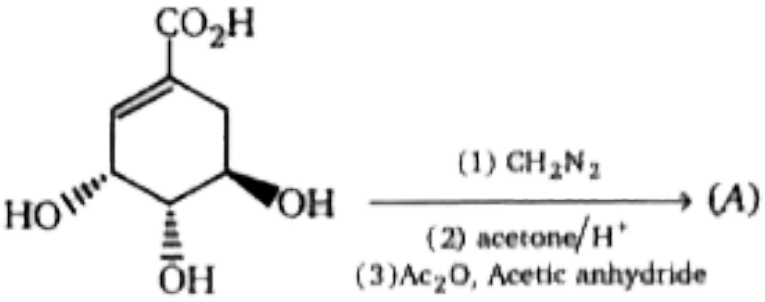
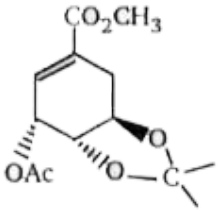
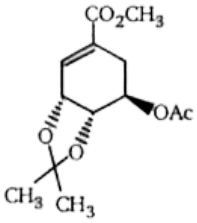


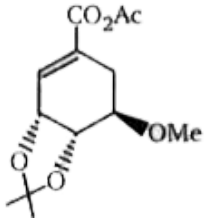
24. (de-

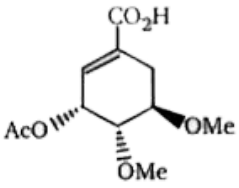
colourises Br_2 water)

Product (A) of the above reaction is :

A.


B.


C.


D. 

Answer: B

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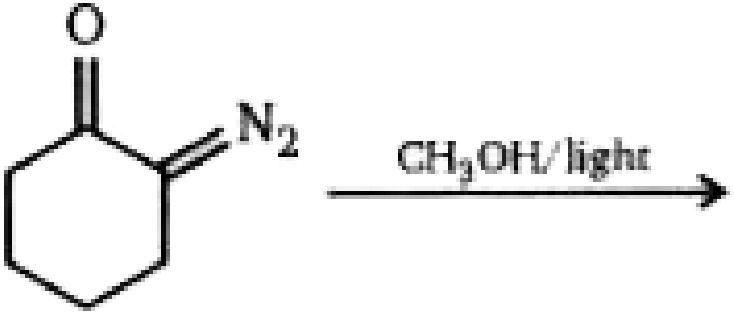
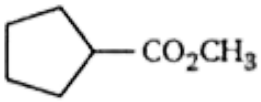
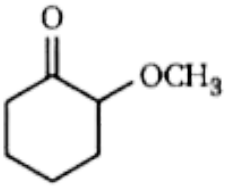
25. A rather interesting example of the Wolff rearrangement with 2-diazocyclohexanone in methanol is given below. Identify the major product:

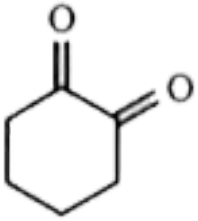


A. 

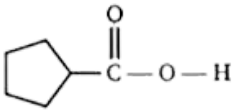
B.



C.



D.



Answer: A

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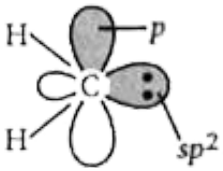
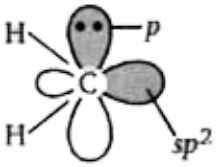
26. The orbital picture of a singlet carbene $(:CH_2)$ can be drawn as:

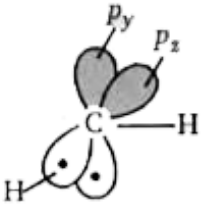
A.



B.



C.



D. none of these

Answer: A

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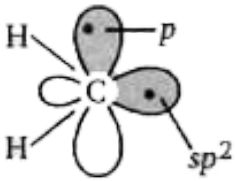
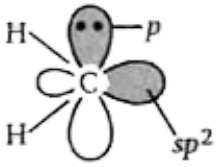
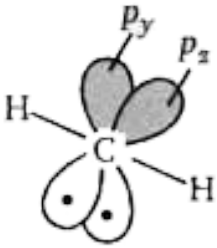
27. The orbital picture of a triplet carbene can be drawn as :

A.





B.



C.

D. none of these

Answer: C

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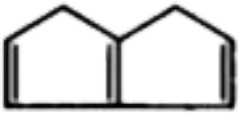
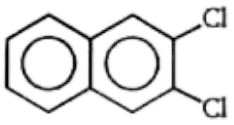
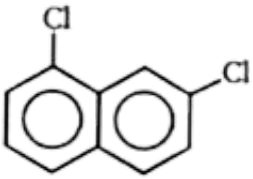


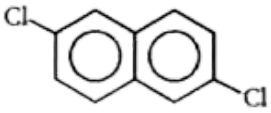
$\xrightarrow[KOH]{CHCl_3} (A) \xrightarrow[KOH]{CHCl_3} (B)$;

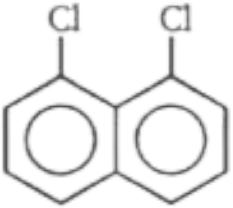
28. Product

(B) is:

A. 

B. 

C. 

D. 

Answer: C

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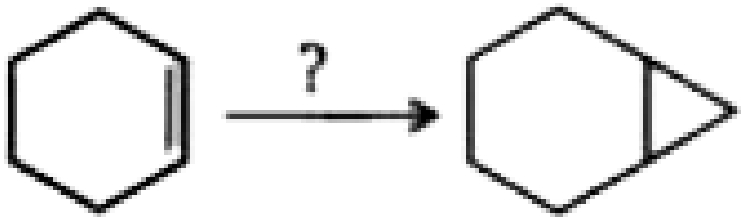

29.

Select the suitable reagent for above conversion.

A. CH_2N_2 / Δ

B. CBr_4 / RLi

C. $H_2C = CH_2$

D. t-BuOK

Answer: A

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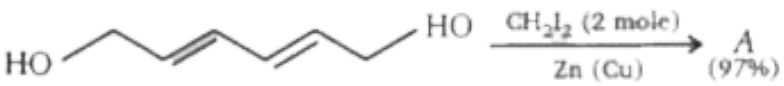
30. Complete the following reaction



A. 

B. 

C. 

D. 

Answer: B

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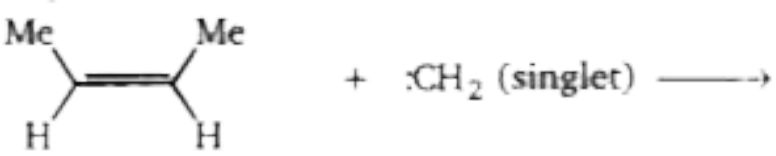
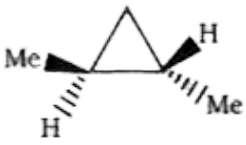
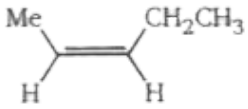
31. The major product formed in the following reaction is



A. 

B. 

C. 50:50 mixture of above two compounds

D. 

Answer: A

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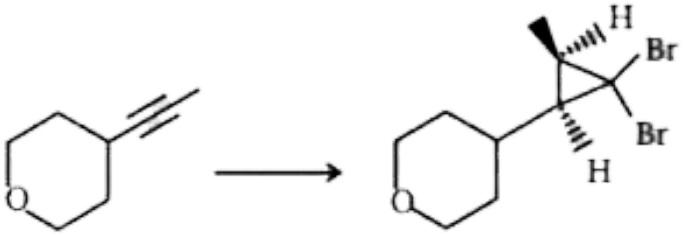

32.

To carry out conversion reagent used in decreasing order.

A. $Na/\text{liq. } NH_3, ChBr_3/NaOH(\Delta)$

B. $H_2/Pd-CaCO_3, CHBr_3/NaOH(\Delta)$

C. $Na/\text{liq. } NH_3, CHCl_3/NaOH$

D. $H_2/Pd-CaCO_3, CHCl_3/NaOH$

Answer: B

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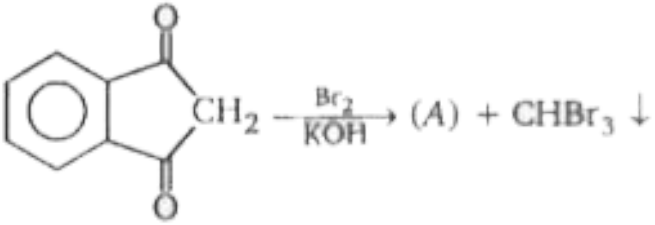
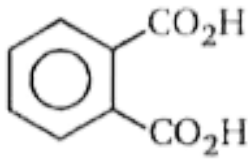
33.

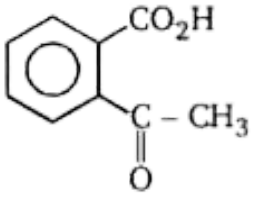


Product (A) of the reaction is :

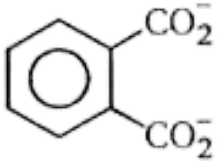
A.

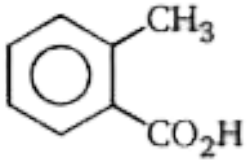


B.



C.



D. 

Answer: C

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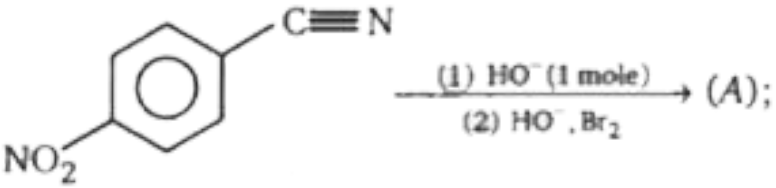
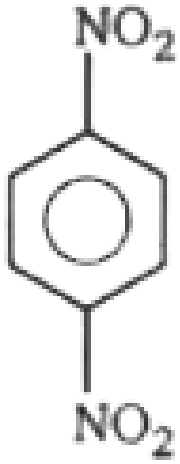
34.  Product

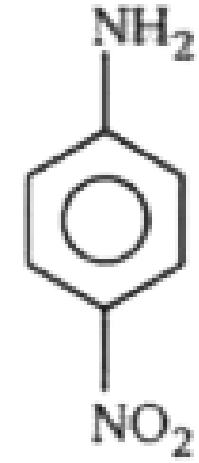
(A) is :

A.

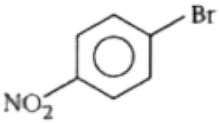


B.

C.



D.



Answer: C

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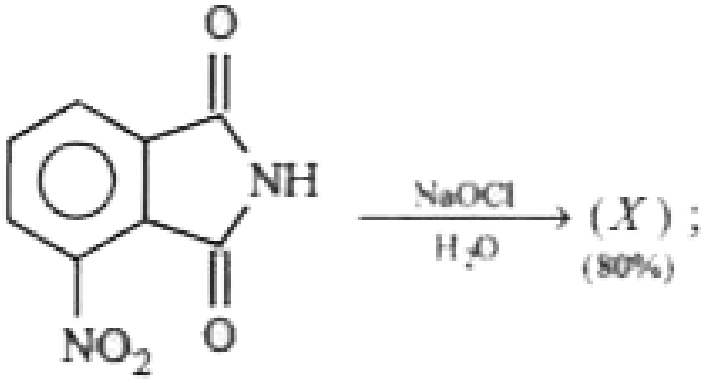
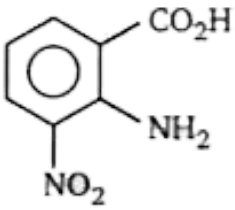
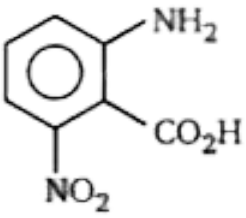


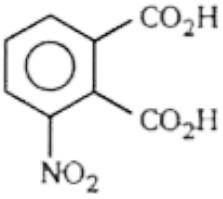
35. Product X will be :



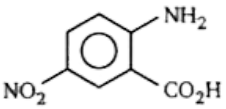
A.



B.



C.

D. 

Answer: B

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36. $CH_3 - CH_2 - CH_2 - CH_2 - CH_3 \xrightarrow{CH_2N_2 / \Delta}$ Products

Which of the following product(s) is/are can be obtained in the above reaction.

A. Isopentane

B. 3-Methyl hexane

C. n-Pentane

D. 3-Methyl pentane

Answer: D

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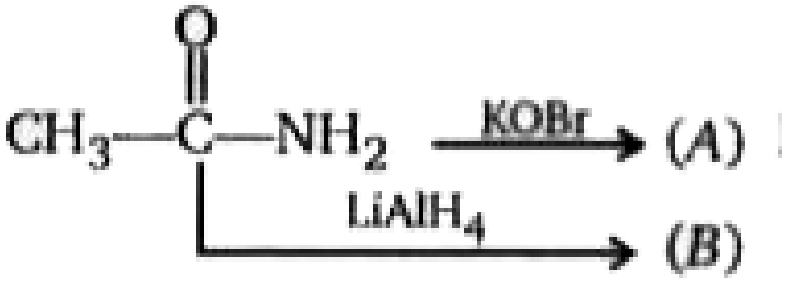

37. Relation between (A) & (B) is:

A. Identical

B. Functional isomer

C. Homologous

D. Positional isomers

Answer: C

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38. If we use pyrene (CCl_4) in the Riemer-Tiemann reaction in place of chloroform, the productformed is :

A. Salicylaldehyde

B. Phenolphthalein

C. Salicylic acid

D. Cyclohexanol

Answer: C

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39. Alkyl ethylamine is heated with chloroform and alcoholic KOH, a compound with offensive smell is formed. This compound is :

A. A secondary amine

B. An isocyanide

C. A cyanide

D. An acid

Answer: B

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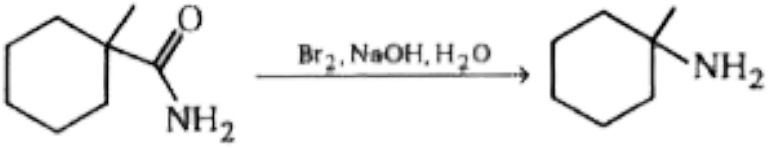
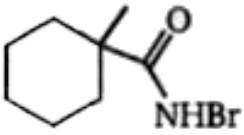
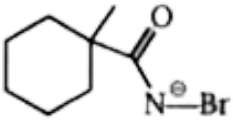
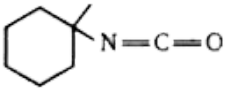
40. Which of the following species would not be involved in the Hoffmann rearrangement shown below?



A. 

B. 

C. 

D. All of the above are involved in the reaction.

Answer: D

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41. In which of the following reactions migration of alkyl group from carbon to oxygen is observed ?

A. Pinacol-pinacolone rearrangement

B. Bayer-villiger oxidation.

C. Prepration of phenol from cumene hydroperoxide.

D. Both (b) & (c)

Answer: D

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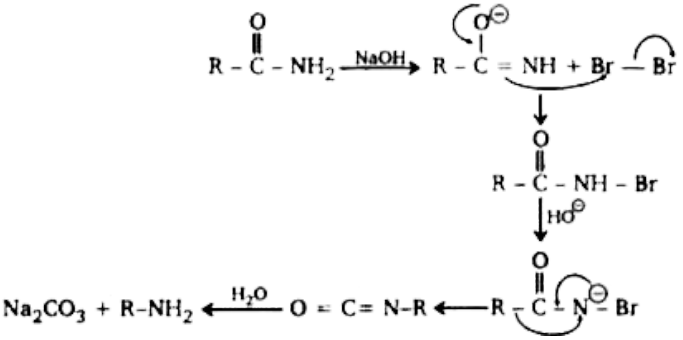
Level 2 Comprehension

1. Hoffmann bromamide reaction involves conversion of a carboxylic acid amide into an amine with a loss of a carbon atom on treatment with

aqueous sodium hypobromite. Thus Hoffmann result in shortening of a carbon chain.

$$R-\overset{\overset{O}{||}}{C}-NH_2 \xrightarrow[NaOH]{Br_2} R-NH_2+NaBr+Na_2CO_3$$

Mechanism of the reaction is :



Number of moles of NaOH consumed in above reaction.

A. 1

B. 2

C. 3

D. 4

Answer: D

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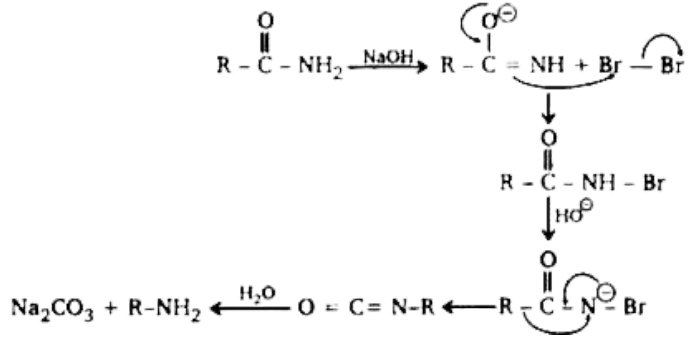
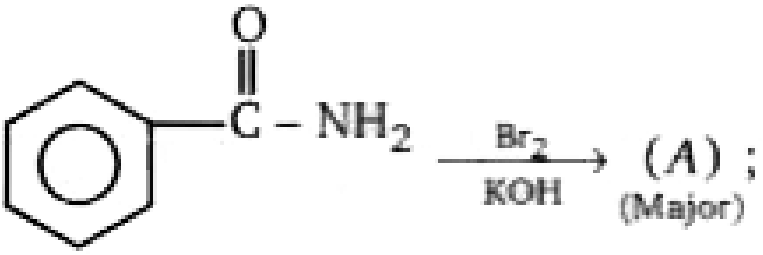
2. Hoffmann bromamide reaction involves conversion of a carboxylic acid amide into an amine with a loss of a carbon atom on treatment with aqueous sodium hypobromite. Thus Hoffmann result in shortening of a carbon chain.

$$R-\overset{O}{\overset{||}{C}}-NH_2 \xrightarrow[NaOH]{Br_2} R-NH_2+NaBr+Na_2CO_3$$

Mechanism of the reaction is :



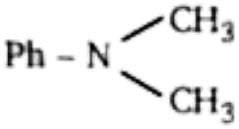


Product (A) :

A. $Ph-NH_2$

B. $Ph-CH_2-NH_2$

C. $Ph - NH - CH_3$

D. 

Answer: A

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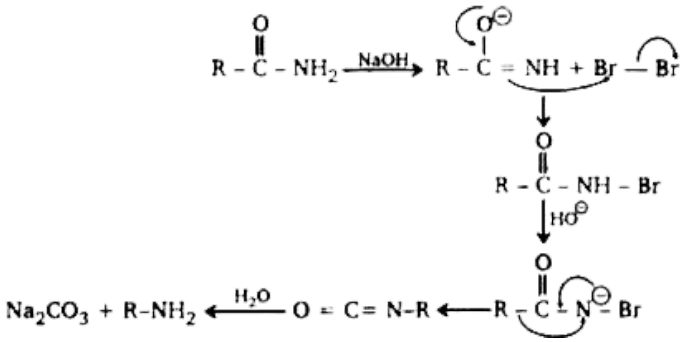
3. Hoffmann bromamide reaction involves conversion of a carboxylic acid amide into an amine with a loss of a carbon atom on treatment with aqueous sodium hypobromite. Thus Hoffmann result in shortening of a carbon chain.

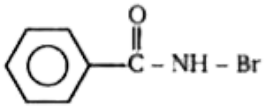
$$R - \overset{O}{\overset{||}{C}} - NH_2 \xrightarrow[NaOH]{Br_2} R - NH_2 + NaBr + Na_2CO_3$$

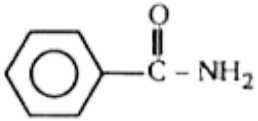
Mechanism of the reaction is :

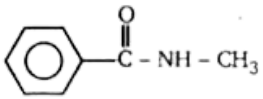


Which of the following will not give Hoffmann bromamide reaction.

A. $CH_3 - \overset{O}{\overset{||}{C}} - NH_2$

B. 

C. 

D. 

Answer: D

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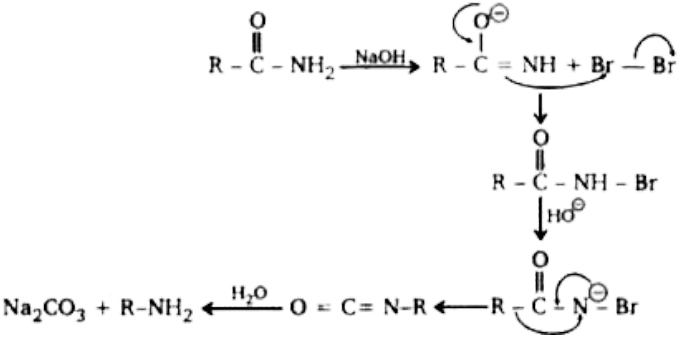
4. Hoffmann bromamide reaction involves conversion of a carboxylic acid amide into an amine with a loss of a carbon atom on treatment with aqueous sodium hypobromite. Thus Hoffmann result in shortening of a carbon chain.

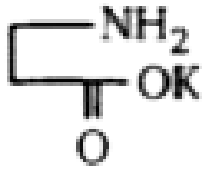
$$R-\overset{\overset{O}{||}}{C}-NH_2 \xrightarrow[NaOH]{Br_2} R-NH_2+NaBr+Na_2CO_3$$

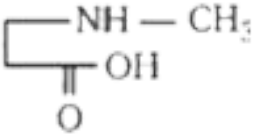
Mechanism of the reaction is :



Product (A) is

:

A. 

B. 

C. 

D. None of these

Answer: A

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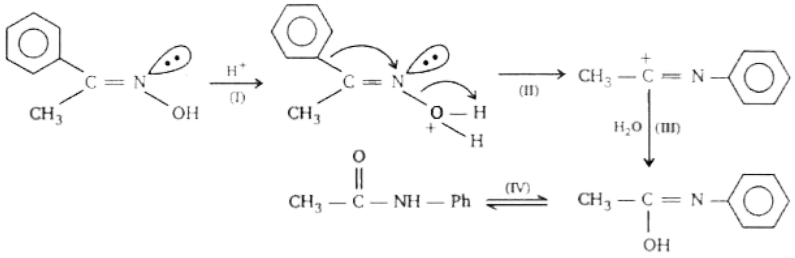
5. Given is mechanism of Beckmann rearrangement.



Rate determining step in Beckmann rearrangement:

A. I

B. II

C. III

D. IV

Answer: B

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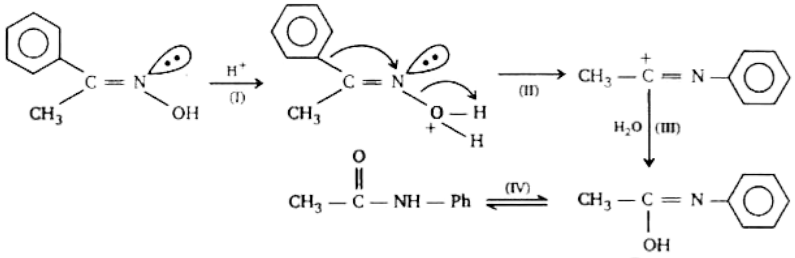
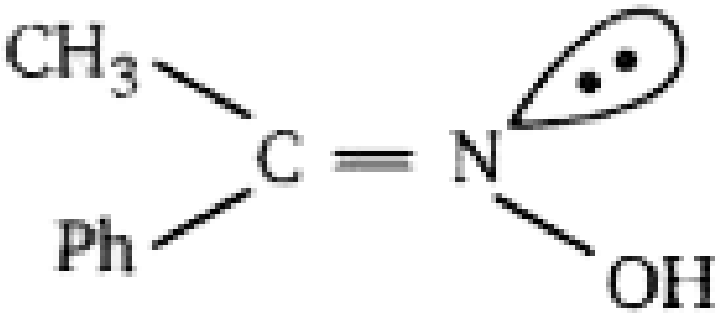
6. Given is mechanism of Beckmann rearrangement.





On treatment H_2SO_4 followed by hydrolysis in acidic medium above compound gives.

A. $CH_3 - CO_2H, Ph - NH_2$

B. $CH_3 - NH_2, Ph - CO_2H$

C. $Ph - CH_2 - NH_2 + Ph - CO_2H$

D. $Ph - CO_2H + CH_3 - CO_2H$

Answer: B

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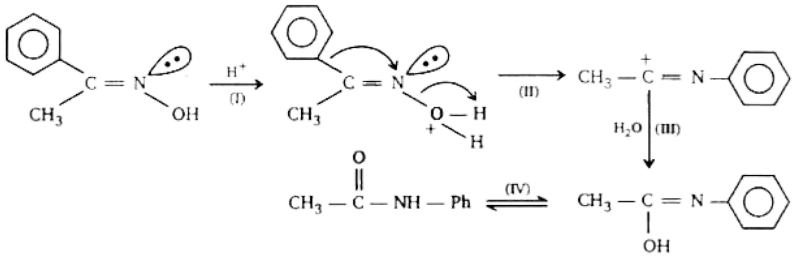
7. Given is mechanism of Beckmann rearrangement.



Which of the following reagent cannot used in Beckmann rearrangement?

A. TsOH

B. $R - SO_2H$

C. BF_3

D. $Ph - Li$

Answer: D

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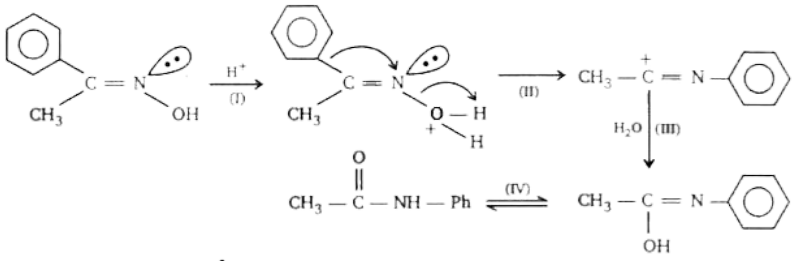
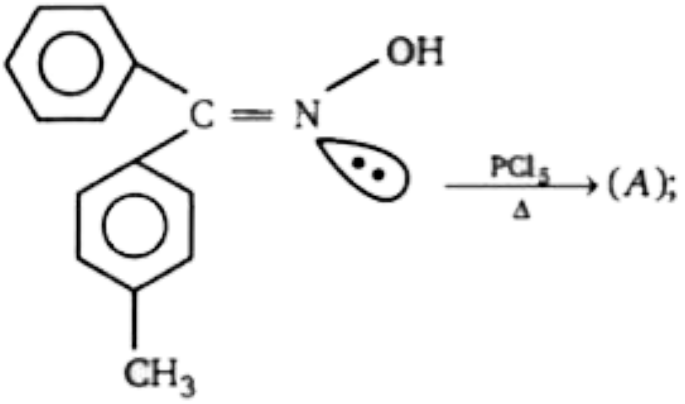
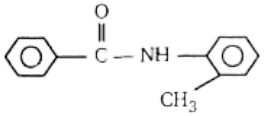
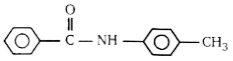
8. Given is mechanism of Beckmann rearrangement.

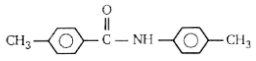


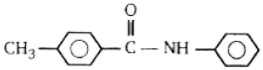


Product (A) of the above reaction is :

A. 

B. 

C. 

D. 

Answer: B

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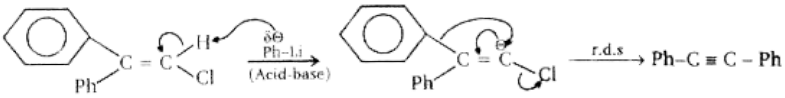
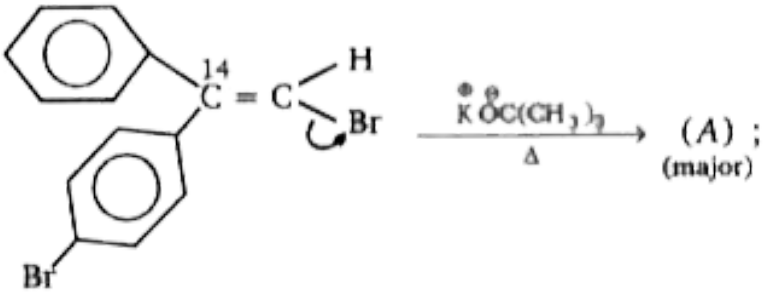
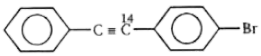
9. Consider the given reaction for preparation of alkyne. (Fritsch reaction).

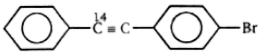


Anti group will migrate because of less steric hindrance.



Major product (A) is :

A. 

B. 

C. $Ph - C \equiv C^{14} - Ph$

D. $Ph - C \equiv C - Ph$

Answer: A

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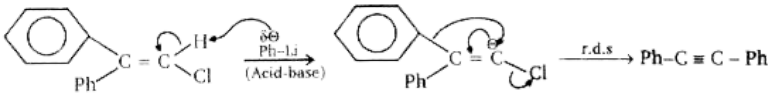
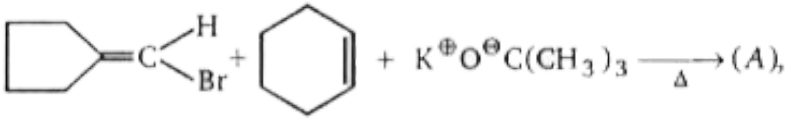
10. Consider the given reaction for preparation of alkyne. (Fritsch reaction).



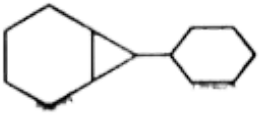
Anti group will migrate because of less steric hindrance.



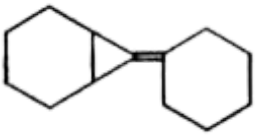
Product (A) is

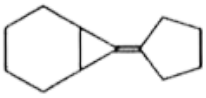
:

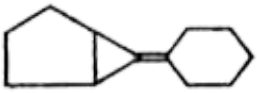
A.



B.



C. 

D. 

Answer: C

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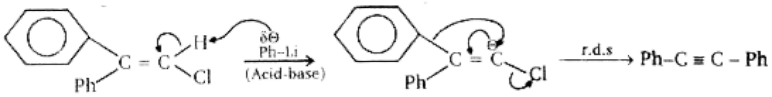
11. Consider the given reaction for preparation of alkyne. (Fritsch reaction).



Anti group will migrate because of less steric hindrance.

Rate of reaction when the halide ion:

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

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

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

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

Answer: B

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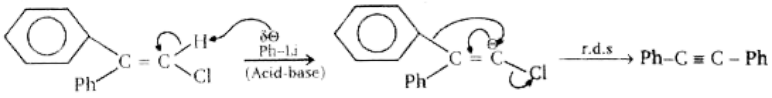
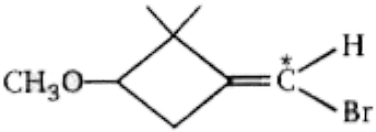
12. Consider the given reaction for preparation of alkyne. (Fritsch reaction).



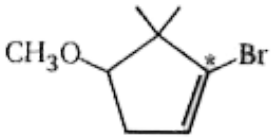
Anti group will migrate because of less steric hindrance.

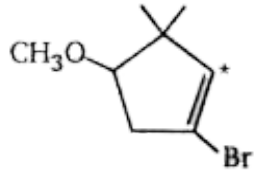


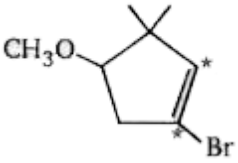
(A) (Major) ,

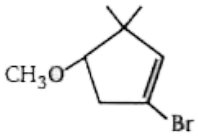
Product (A) is : $(C^* = C^{14})$

A.



B. 

C. 

D. 

Answer: B

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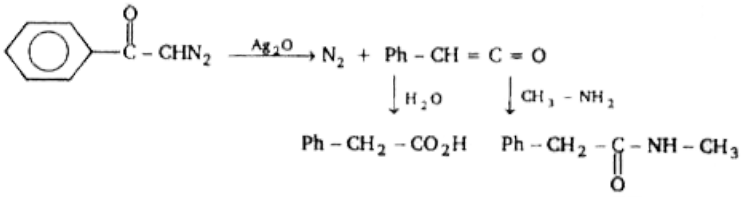
13. Wolff rearrangement

When α-Diazoketones are photo-irradiated or heated at high temperature or reacted with silver oxide or silver salts at room temperature, they loose nitrogen and rearrange to form ketene.

The ketenes reacts rapidly with water, alcohol and amines. Therefore, the reactions called Wolff-rearrangement.



$Ph - \overset{\overset{O}{||}}{\underset{14}{C}} - CHN_2 \xrightarrow[H_2O]{Ag_2O} (A)$, Product (A) is :

A. $Ph - \overset{14}{C}H_2 - CO_2H$

B. $Ph - CH_2 - \overset{14}{C}O_2H$

C. $Ph - \overset{14}{C}O_2N$

D. $Ph - CO_2H$

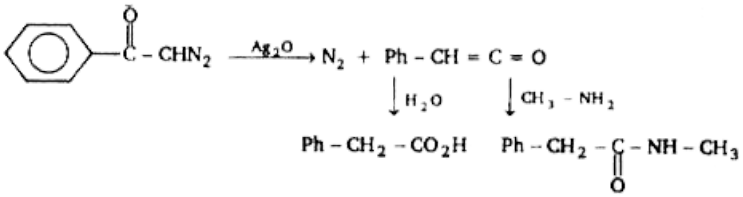
Answer: B

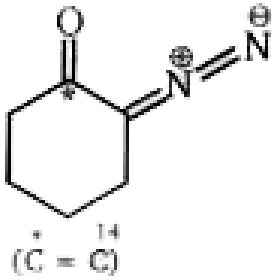
Watch Video Solution

14. Wolff rearrangement

When α-Diazoketones are photo-irradiated or heated at high temperature or reacted with silver oxide or silver salts at room temperature, they loose nitrogen and rearrange to form ketene.

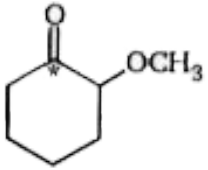
The ketenes reacts rapidly with water, alcohol and amines. Therefore, the reactions called Wolff-rearrangement.

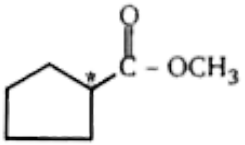


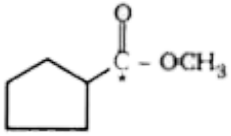


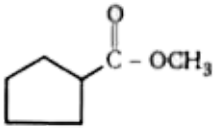
$\xrightarrow[h\nu]{CH_3OH}$ (A) (Major),

Product (A) is :

A. 

B. 

C. 

D. 

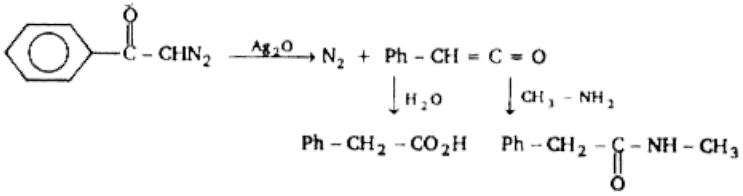
Answer: C

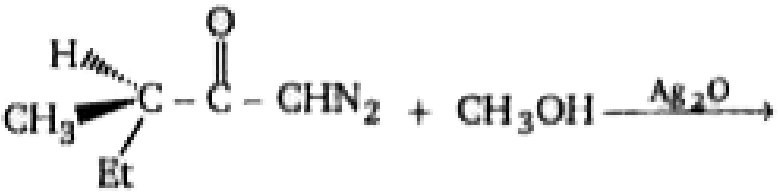
Watch Video Solution

15. Wolff rearrangement

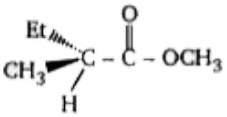
When α-Diazoketones are photo-irradiated or heated at high temperature or reacted with silver oxide or silver salts at room temperature, they loose nitrogen and rearrange to form ketene.

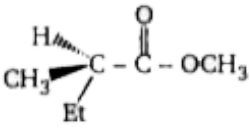
The ketenes reacts rapidly with water, alcohol and amines. Therefore, the reactions called Wolff-rearrangement.

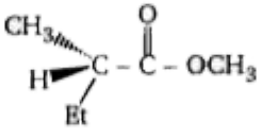




Major product of the reaction is :

A. 

B. 

C. 

D. None of these

Answer: D

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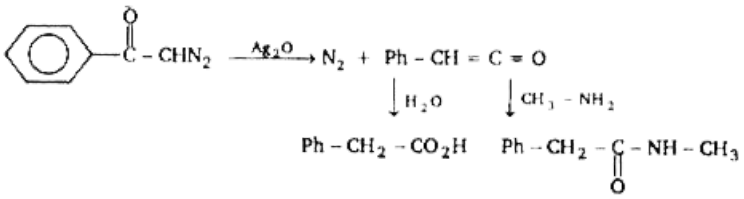
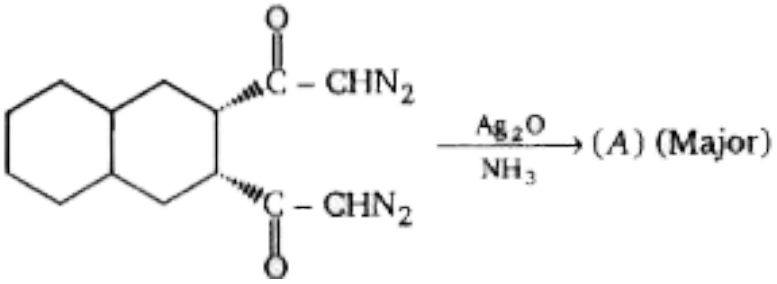
16. Wolff rearrangement

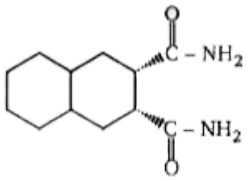
When α-Diazoketones are photo-irradiated or heated at high temperature or reacted with silver oxide or silver salts at room temperature, they loose nitrogen and rearrange to form ketene.

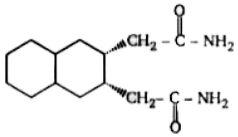
The ketenes reacts rapidly with water, alcohol and amines. Therefore, the reactions called Wolff-rearrangement.

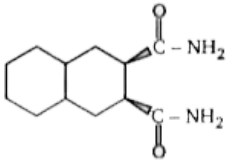


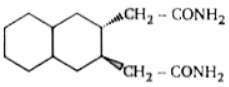


, Product (A) is :

A. 

B. 

C. 

D. 

Answer: B

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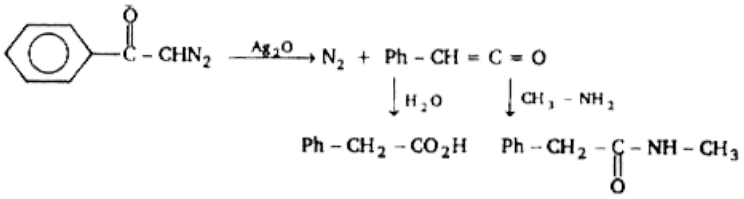
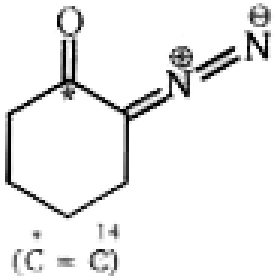
17. Wolff rearrangement

When α-Diazoketones are photo-irradiated or heated at high temperature or reacted with silver oxide or silver salts at room temperature, they loose nitrogen and rearrange to form ketene.

The ketenes reacts rapidly with water, alcohol and amines. Therefore, the reactions called Wolff-rearrangement.





$\xrightarrow[h\nu]{CH_3OH}$ (A) (Major),

Product (A) is

:

A. $Ph - Ch = CH - OH$

B. $Ph - CH = CH - OCH_3$

C. $CH_3 - CH = CH - O - PH$

D. $CH_3 - CH = CH - OH$

Answer: B

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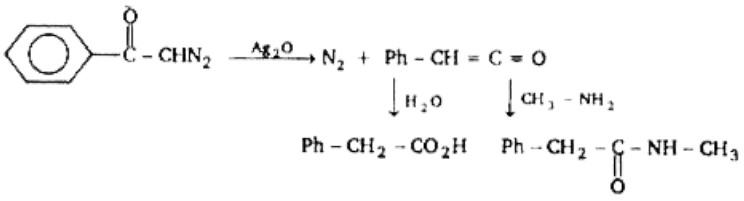
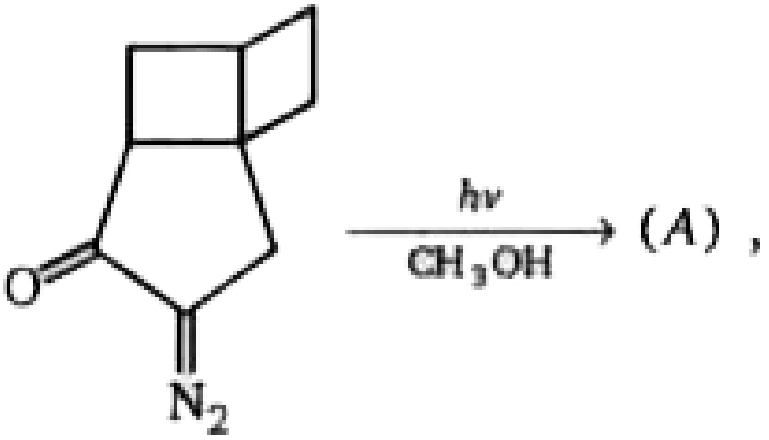
18. Wolff rearrangement

When α-Diazoketones are photo-irradiated or heated at high temperature or reacted with silver oxide or silver salts at room temperature, they loose nitrogen and rearrange to form ketene.

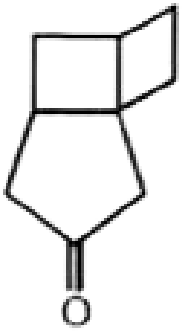
The ketenes reacts rapidly with water, alcohol and amines. Therefore, the reactions called Wolff-rearrangement.



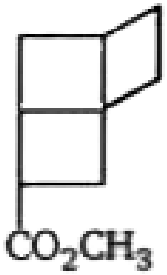


, Product (A) is :

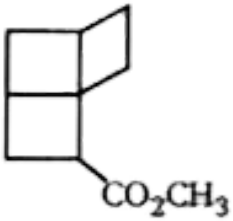
A.



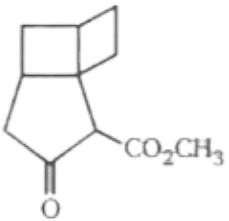
B.



C.



D.



Answer: B

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19. Wolff rearrangement

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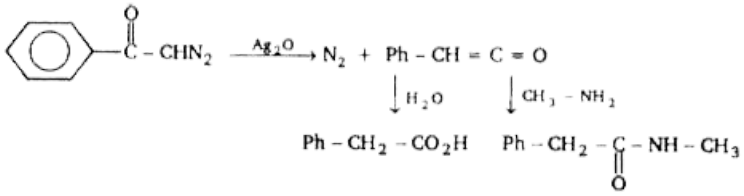
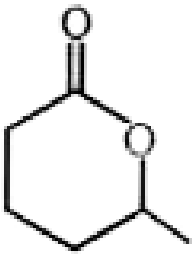
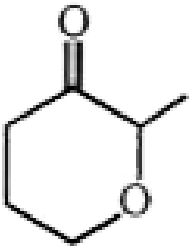
The ketenes reacts rapidly with water, alcohol and amines. Therefore, the reactions called Wolff-rearrangement.



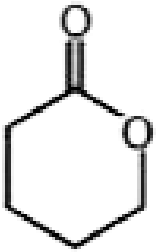
$HO-CH_2-CH_2-CH_2-\overset{O}{\overset{||}{C}}-CHN_2 \xrightarrow[\Delta]{Ag_2O} (A)$, Product (A) is :



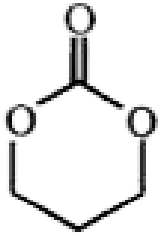
A.



B.



C.



D.

Answer: C

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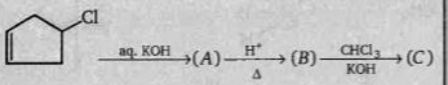
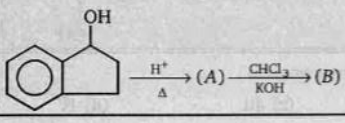
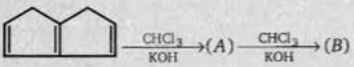
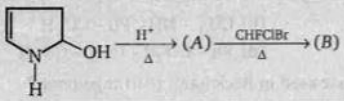
Level 2

1. Match the column I and II.

	Column (I)		Column (II)
(a)		(p)	D.B.E. = even for product (Double bond equivalent)
(b)		(q)	D.B.E. = odd for product
(c)		(r)	Ring expansion takes place
(d)		(s)	Carbene will formed

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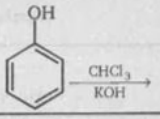
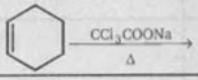
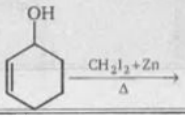
2. Match the column I and II.

	Column (I)		Column (II)
(a)		(p)	Reimer Tiemann reaction
(b)		(q)	Reimer Tiemann expansion (**or**) Abnormal RNT reaction
(c)		(r)	Simman-smith reaction.
(d)		(s)	Increase in carbon takes place

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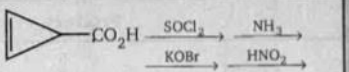
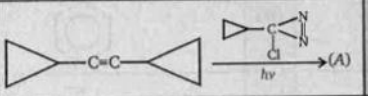
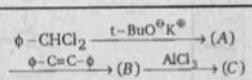
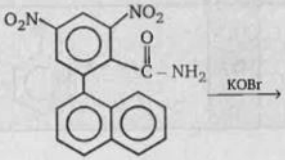
3. Match the column I and II.

3.

	Column (I)		Column (II)
(a)		(p)	Aromatic compound will formed
(b)		(q)	Migration take place from carbon to electron deficient nitrogen
(c)		(r)	Carbene will formed in this reaction
(d)		(s)	N_2 will evolve.

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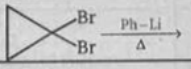
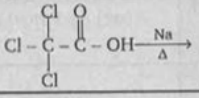
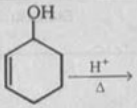
4. Match the column I and II.

Column (I)		Column (II)	
Reaction		Intermediate	
(a)	$CHCl_3 + KOH \xrightarrow[\Delta]{}$	(p)	Carbocation
(b)		(q)	Carbanion
(c)		(r)	Free radical
(d)		(s)	Carbene

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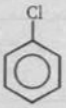
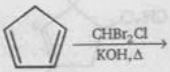
5. Matrix :

Column (I)		Column (II)	
Reaction		Product	
(a)		(p)	
(b)		(q)	
(c)		(r)	
(d)		(s)	

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