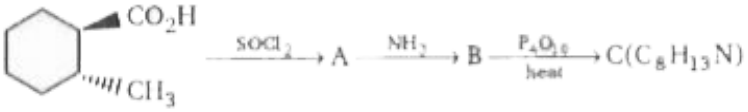
CHEMISTRY

BOOKS - MS CHOUHAN

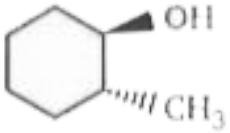
CARBOXYLIC ACID AND THEIR DERIVATIVES

Level 1

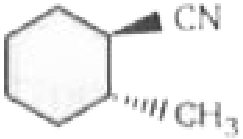
1. Identify C in the following sequence of reactions

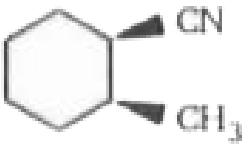


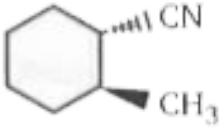
A.



B.



C. 

D. 

Answer: B

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2. Saponification (basic hydrolysis) of $C_6H_5\underset{\underset{O}{||}}{C}OCH_3$ will yield : [O= mass- 18 isotope of oxygen]

A. $C_6H_5-\overset{\overset{O}{||}}{C}-O^- + HOCH_3$

B. $C_6H_5-\overset{\overset{O}{||}}{C}-O^- + HOCH_3$

C. $C_6H_5\underset{\underset{O}{||}}{C}O^- + HO^-$

D. $C_6H_5\underset{\underset{O}{||}}{C}O^- + HOCH_3$

Answer: B

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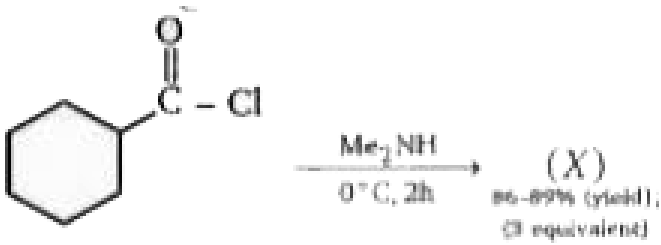
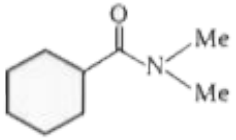


3. Product (X) of the reaction is:

A.


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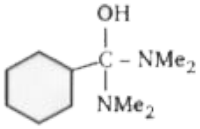
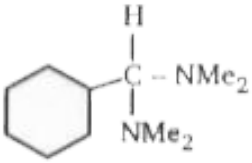
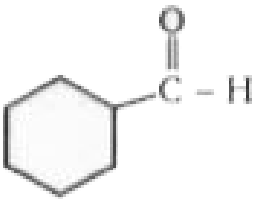


C.


D. 

Answer: A

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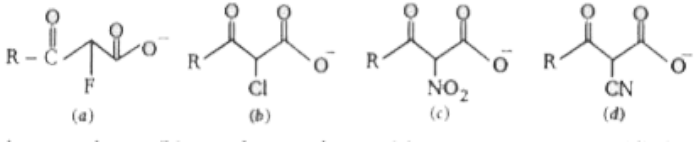
4. Which of the following is the correct order of decarboxylation of β-keto carboxylate anion ?



A. $a > b > c > d$

B. $c > d > a > b$

C. $c > d > b > a$

D. $d > c > a > b$

Answer: C

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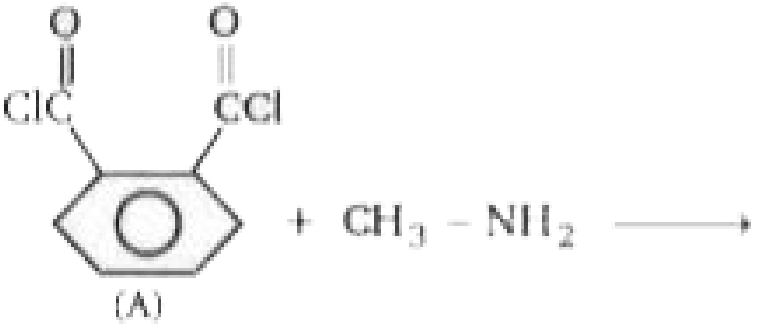
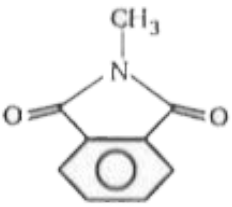
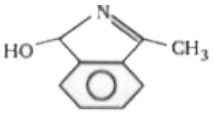
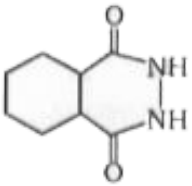
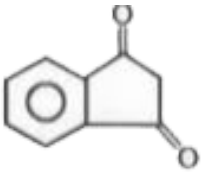


5. Product of the reaction is:

A.


B.


C.


D.


Answer: A

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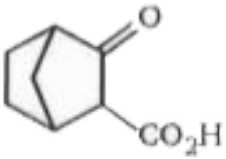
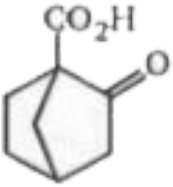
6. Which β- keto acid shown will not undergo decarboxylation ?

A. 

B. 

C. $Ph - \overset{\overset{O}{||}}{C} - CH_2 - CO_2H$

D. $CH_3 - \overset{\overset{O}{||}}{C} - CH_2 - CO_2H$

Answer: B

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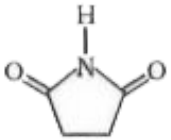
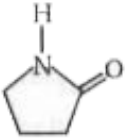
7. Choose the response that matches the correct functional group classification with the following group of structural formulas.





(a) Anhydride	Lactam	Lactone
(b) Lactam	Imide	Lactone
(c) Imide	Lactone	Anhydride
(d) Imide	Lactam	Lactone

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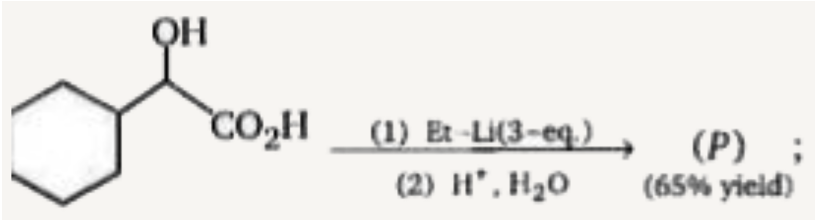
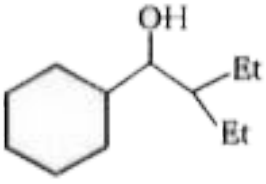
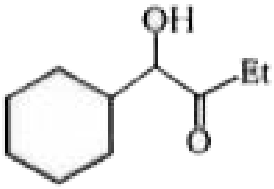
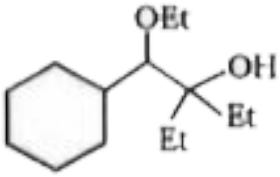
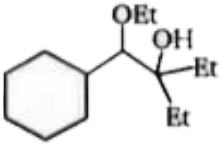
8. 

, Product (P) of the reaction is :

A. 

B. 

C. 

D. 

Answer: B

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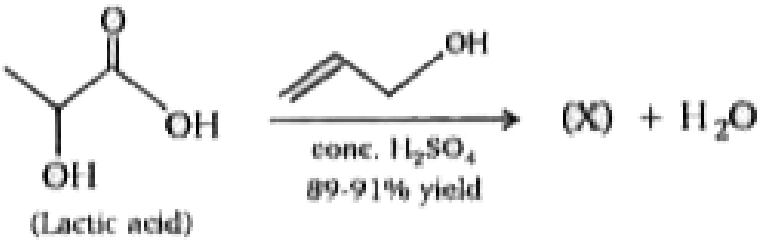
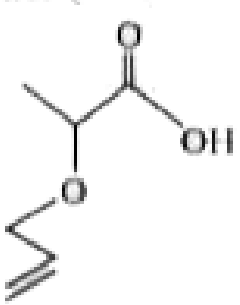
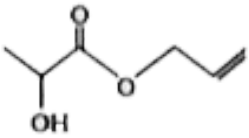
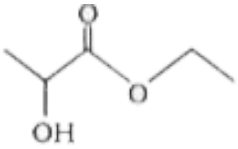
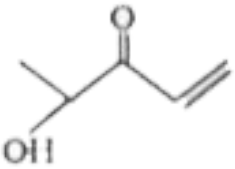
9. 

Product (X) of the reaction is :

A. 

B. 

C. 

D. 

Answer: B

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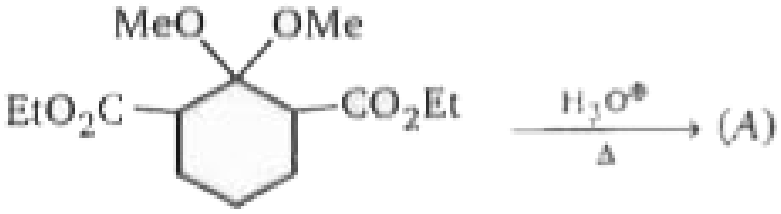
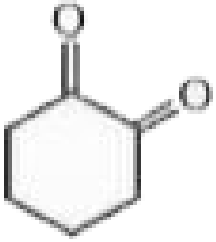
10. 

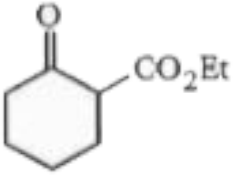
Product

(A) of the reaction is :

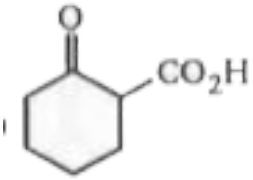


A.

B.



C.

D. 

Answer: B

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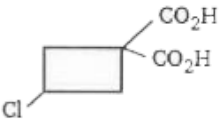
11. Which of the following acid on heating gives geometrical isomers as a product ?

A. $CH_3 - \overset{OH}{\overset{|}{C}}H - CO_2H$

B. 

C. $CH_3 - \underset{OH}{\overset{|}{C}}H - CH_2 - CO_2H$

D. All of these

Answer: D

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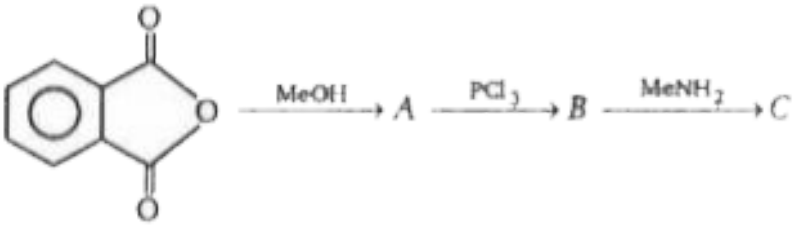
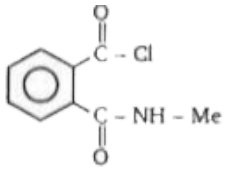
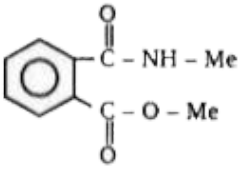
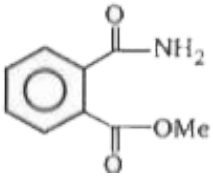
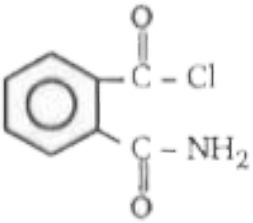
12. 

, Product (C) of the reaction is :

A. 

B. 

C. 

D. 

Answer: B

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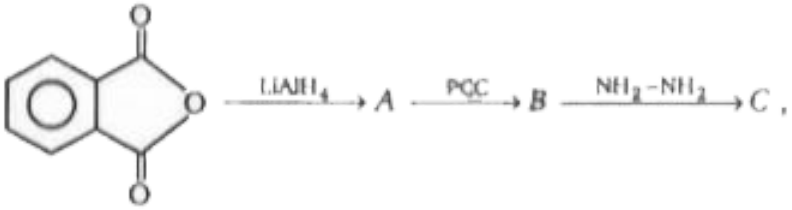
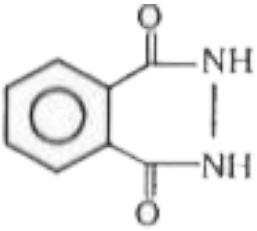
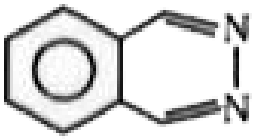
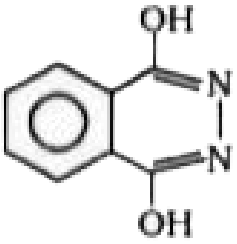
13. 

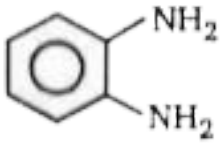
, Product (C) is :

A. 

B. 



C.



D.

Answer: B

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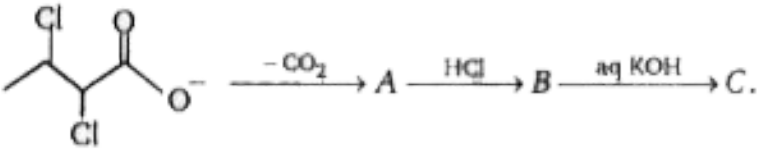
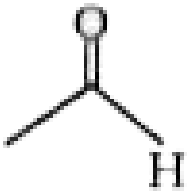
14. 

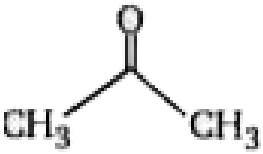
, Product

(C) is :

A. $CH_3 - CH_2 - \overset{O}{\overset{||}{C}} - H$

B. 

C. 

D. 

Answer: A

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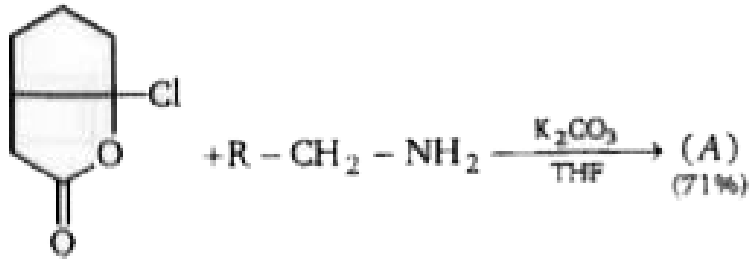
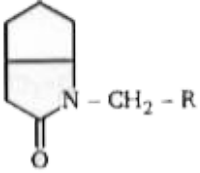
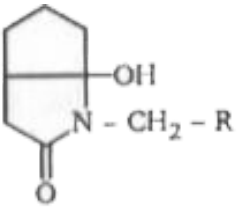
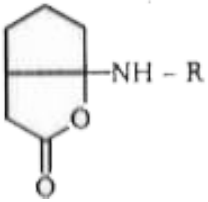
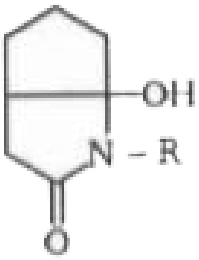
15. 

In above reaction identify major product (A) of the reaction:

A. 

B. 

C. 

D. 

Answer: B

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16. A chiral compound X with molecular formula $C_4H_8O_3$ liberates CO_2 with aq. $NaHCO_3$. X on reduction with $LiAlH_4$ gives achiral product . The structure of X is

A. $CH_3CH_2\underset{\underset{OH}{|}}{C}HCOOH$

B. $CH_3\underset{\underset{Me}{|}}{C}HCOOH$

C. $CH_3CH\underset{\underset{CH_2OH}{|}}{C}OOH$

D. $CH_3\underset{\underset{OH}{|}}{C}HCH_2COOH$

Answer: C

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17. $CH_3-\overset{\overset{O}{||}}{C}-O-CH_2-CH_3+H-O^- \rightarrow (O=O^{18})$

One of the product of the reaction is :

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

B. $CH_3 - CH_2 - O - H$

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

D. $CH_3 - CH_2 - O^-$

Answer: C

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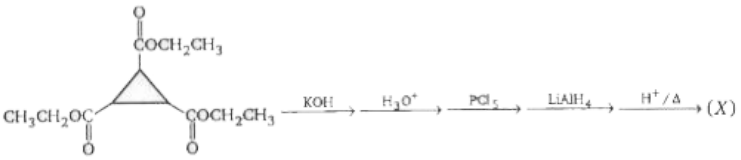
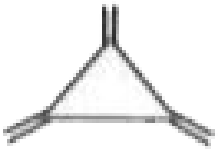
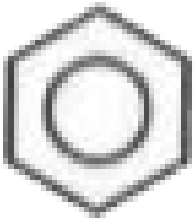
18.



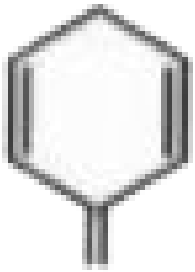
Product (X) is :

A.





B.



C.

D.

Answer: B

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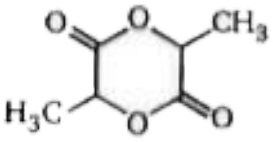
19. Identify final product In the following reaction

$2CH_3 - \underset{OH}{\underset{|}{C}}H - COOH \xrightarrow{\Delta}$ product

A. 

B. $CH_2 = CHCO_2H$

C. $CH_3 - \overset{\overset{O}{||}}{C}CO_2H$

D. CH_3CH_2OH

Answer: A

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20. Select the final product from this sequence of reactions

$$\text{Acetoacetic ester} \xrightarrow{NaOEt} \xrightarrow{CH_3I} \xrightarrow{NaOEt} \xrightarrow{CH_3CH_2CH_2Br}$$

A. $H_3C - \overset{\overset{O}{||}}{C} - \underset{\underset{CH_2CH_2CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - COOC_2H_5$

B. $H_3C - \underset{\underset{CH_2CH_2CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - CH_2COOC_2H_5$

C. $H_3C - \underset{\underset{CH_2CH_2CH_3}{|}}{\overset{\overset{H}{|}}{C}} - CH_2COOC_2H_5$

D. $CH_3CO - \underset{CH_3}{\overset{CH_3}{C}} - CH_2COOC_2H_5$

Answer: A

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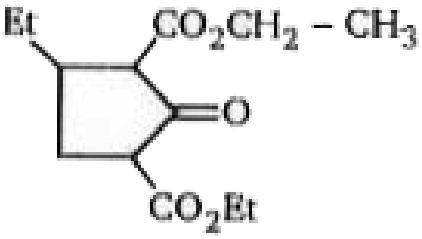
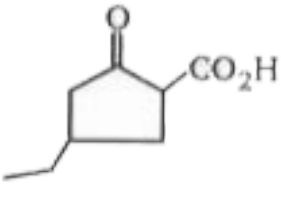
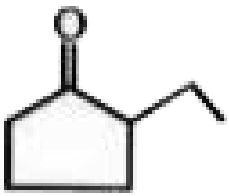
21. 

$\xrightarrow[\text{heat}]{H_2O,\ H_2SO_4}$ (A) ;

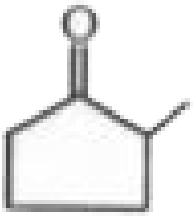
Product (A) will be:

A. 

B.



C.



D.

Answer: B

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22. $CH_2(CO_2Me)_2 + ? \xrightarrow[(ii)\ AcOH]{(i)\ Na} CH(CO_2Me)_3$

Which of the following reactants will complete the above reaction ?

A. $CH_2(CO_2Me)_2$

B. $(CO_2Me)_2$

C. $Cl - CO_2Me$

D. $COCl_2$

Answer: C

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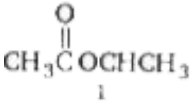
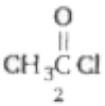
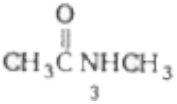
23. Arrange the following in order of increasing reactivity (least to most) towards nucleophile







A. $1 < 2 < 3$

B. $3 < 1 < 2$

C. $1 < 3 < 2$

D. $2 < 1 < 3$

Answer: B

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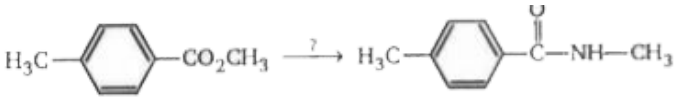
24. Choose the best sequence of reactions for transformation given. Semicolons indicate separate reaction steps to be used in the order shown



A. $H_3O^+, SOCl_2, CH_3NH_2$

B. $HO^- / H_2O, PBr_3, Mg, CO_2, H_3O^-, SoCl_2, CH_3NH_2$

C. $LiAlH_4, H_2O, HBr, Mg, CO_2, H_3O^+, SOCl_2, CH_3NH_2$

D. None of these would yield the desired product.

Answer: A

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25. A key step in the hydrolysis of acetamide in aqueous acid proceeds by nycleophilic addition of :

A. H_3O^+ to $CH_3\overset{\overset{O}{||}}{C}NH_2$

B. H_2O to $CH_3\overset{\overset{+OH}{||}}{C}NH_2$

C. H_3O^+ to $CH_3\overset{\overset{+OH}{||}}{C}NH_2$

D. HO^- to $CH_3\overset{\overset{+OH}{||}}{C}NH_2$

Answer: B

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26. Which reaction is not possible for acetic anhydride ?

A.

$$\left(CH_3\overset{\overset{O}{||}}{C}\right)_2O + 2HN(CH_3)_2 \rightarrow CH_3\overset{\overset{O}{||}}{C}N(CH_3)_2 + CH_3CO_2^- + H_2$$

B.

$$\left(CH_3\overset{\overset{O}{||}}{C}\right)_2 O + CH_3CH_2OH \rightarrow CH_3\overset{\overset{O}{||}}{C}OCH_2CH_3 + CH_3CO_2H$$

C. $$\left(CH_3\overset{\overset{O}{||}}{C}\right)_2 O + C_6H_6 \xrightarrow{AlCl_3} CH_3\overset{\overset{O}{||}}{C}C_6H_5 + CH_3CO_2H$$

D. $$\left(CH_3\overset{\overset{O}{||}}{C}\right)_2 O + NaCl \rightarrow CH_3\overset{\overset{O}{||}}{C}Cl + CH_3CO_2^- Na^+$$

Answer: D

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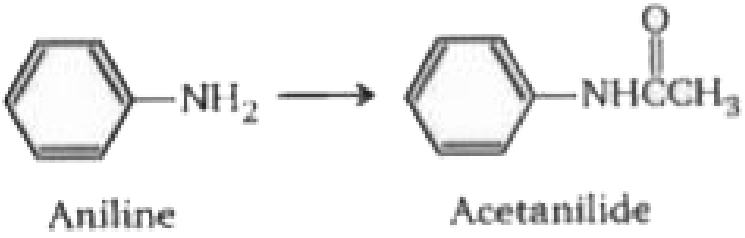
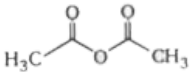
27. All but one of the following compounds react with aniline to give acetanilide. Which of does not?

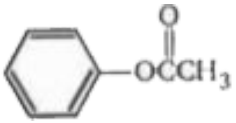


Aniline Acetanilide

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

B. 

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

D. 

Answer: C

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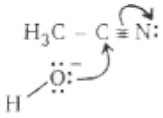
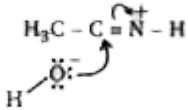
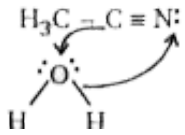
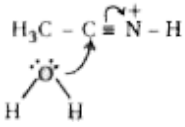
28. Which of the following best describes the nucleophilic addition step in the acid catalyzed hydrolysis of acentonitrile (CH_3CN) ?

A. 

B. 

C. 

D. 

Answer: D

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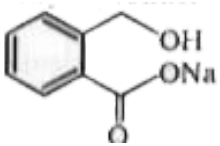
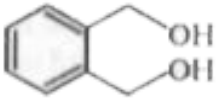
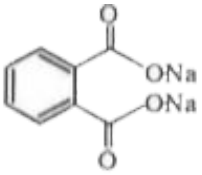
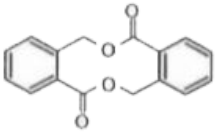
29. The major product expected, when phthalamide is treated with NaOH, is :

A. 

B. 

C. 

D. 

Answer: C

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30. Which of the following acid remains unaffected on heating ?

A. malonic acid

B. maleic acid

C. Fumaric acid

D. Succinic acid

Answer: C

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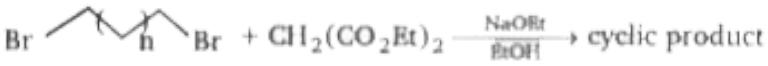
31. 

At which value of n the formation of six membered ring takes place ?

A. n=2

B. n=3

C. n=5

D. n=6

Answer: B

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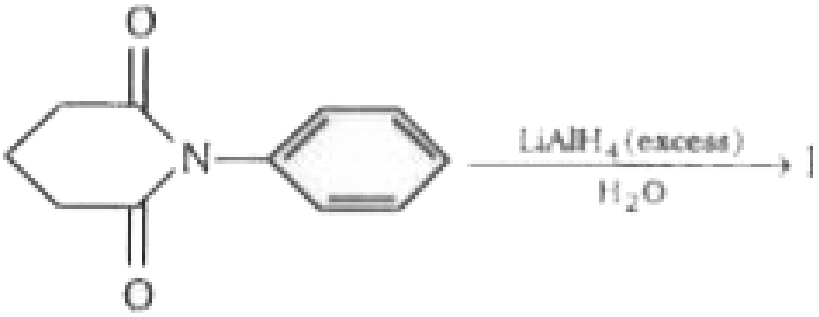
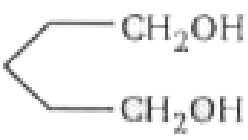
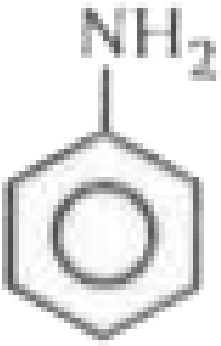
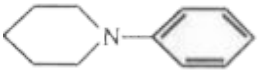
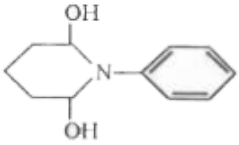
32. 

Product of the reaction is :

A. 

B. 

C. 

D. 

Answer: C

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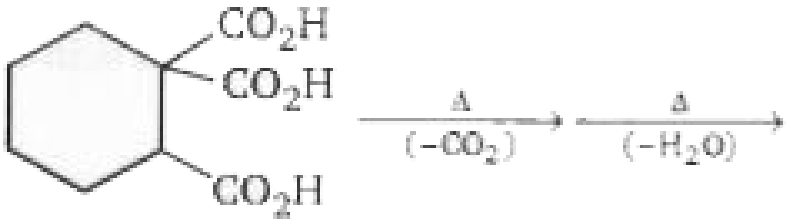

33.

Product of the reaction is :

A. cis-anhydride

B. trans-anhydride

C. both (a) and (b)

D. mono basic acid

Answer: A

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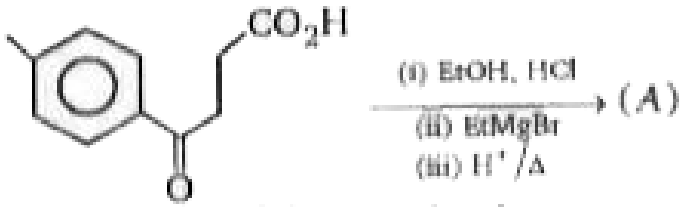
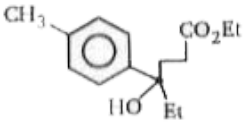
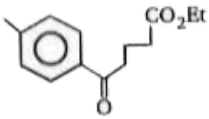
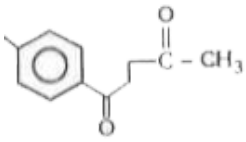
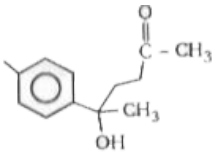
34. 

Product (A) of the reaction is:

A. 

B. 

C. 

D. 

Answer: A

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35.

$$\begin{array}{l} CH_2-O-COR \\ | \\ C \\ | \\ CH_2-O-COR_3 \end{array} \quad H-O-COR_2 + 3NaOH \rightarrow (A) + \text{salt of fatty acid(soap)}$$

Product (A) of the reaction is:

A. Ethylene glycol

B. Glycerol

C. Glyceryltrinitrate (explosive)

D. cumene hydrogen peroxide

Answer: B

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36. $CH_3 - \underset{\underset{(d)}{Et}}{CH} - OAc \xrightarrow{OH^-}$ Product of the reaction is:

A. $CH_3 - \overset{Et}{\overset{|}{C}}H - OH$

B. $CH_3 - \underset{\underset{Et}{|}}{CH} - OH$

C. $CH_3 - \underset{\underset{Et}{|}}{CH} - OH$

(d) & (I)

D. $CH_3 - \underset{\underset{CH_3}{|}}{C} = CH_2$

Answer: A

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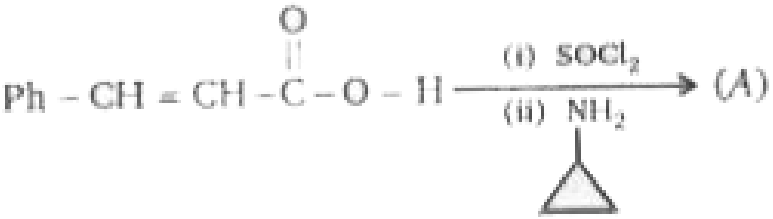
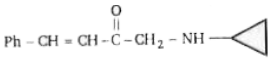
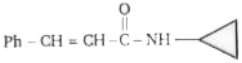
37.



,

Product (A) of the reaction is :

A. 

B. 

C. $Ph - CH = CH - \overset{O}{\overset{||}{C}} - H$

D.

Answer: B

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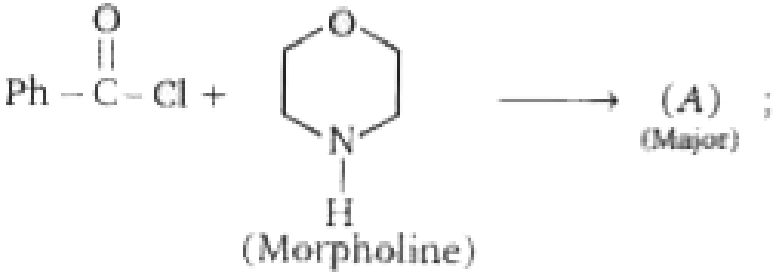
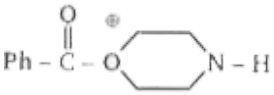
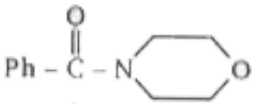
38.

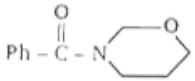


,

Identify the product (A)

A. 

B. 

C. 

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

Answer: B

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39. 

Above reaction is an example of :

A. Esterification

B. Saponification

C. Hydrolysis

D. Trans Esterification

Answer: D

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40. Which of the following is an intermediate formed in the reaction shown below ?

$$CH_3 - \overset{\overset{O}{||}}{C} - Cl + NH_3 \rightarrow \text{Intermediate} \rightarrow \text{product}$$

A. $CH_3 - \overset{\oplus}{N}H_3$

B. $CH_3 - \overset{\overset{O}{||}}{C} \oplus$

C. $Cl - \underset{\underset{\oplus NH_3}{|}}{\overset{\overset{OH}{|}}{C}} - Cl$

D. $CH_3 - \underset{\underset{\oplus NH_3}{|}}{\overset{\overset{O^-}{|}}{C}} - Cl$

Answer: D

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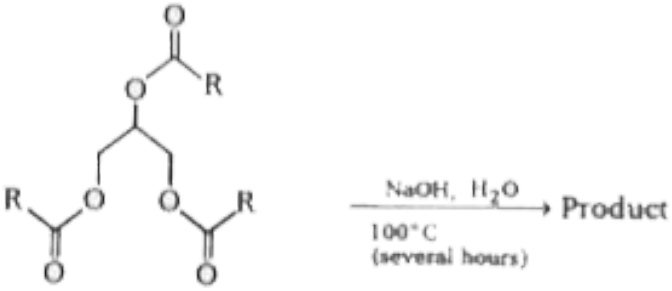
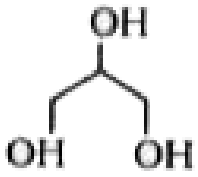
41. 

Product is obtained in the above reaction is:

A. $R - CO_2Na$

B. 

C. both (a) and (b)

D. None of these

Answer: C

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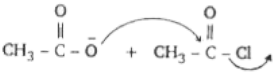
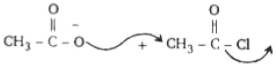
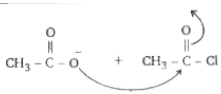
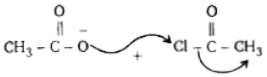
42. The reaction of sodium acetate with acetyl chloride proceeds through which of the following mechanisms ?

A. 

B. 

C. 

D. 

Answer: C

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

$$CH_3 - \overset{O}{\overset{||}{C}} - Cl \xrightarrow{H_2S} \text{product}$$

A. $CH_3 - \overset{\overset{OH}{|}}{\underset{\underset{SH}{|}}{C}} - Cl$

B. $CH_3 - \overset{\overset{O}{||}}{C} - SH$

C. $CH_3 - \overset{\overset{S}{||}}{C} - Cl$

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

Answer: B

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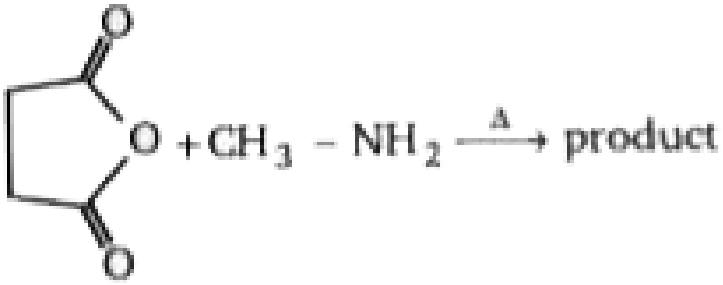
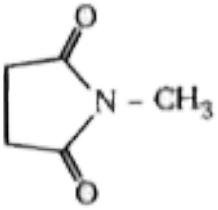
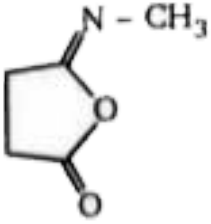
44. Which is the major product of the following reaction ?



A. 

B. 

C. $HO-\overset{\overset{O}{||}}{C}-CH_2-CH_2-\overset{\overset{O}{||}}{C}-NH-CH_3$

D. $CH_3-NH-\overset{\overset{O}{||}}{C}-CH_2-CH_2-\overset{\overset{O}{||}}{C}-NH-CH_3$

Answer: C

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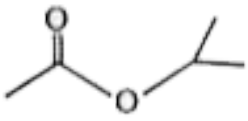
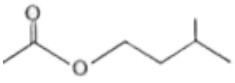
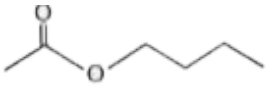
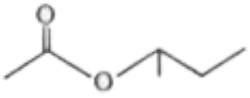
45. Ethanoic acid + 3 methyl-1-butanol $\underset{\text{traces}H_2SO_4}{\Longleftrightarrow}(A)$, Compound (A) is :

A. 

B. 

C. 

D. 

Answer: B

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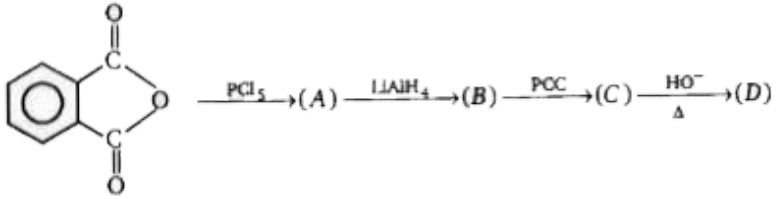
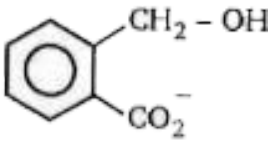
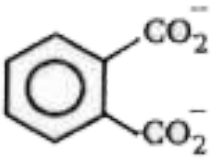
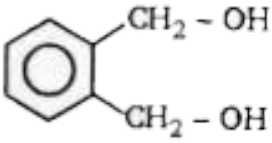
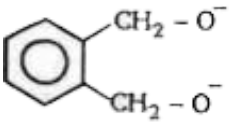
46. 

A. 

B. 

C. 

D. 

Answer: A

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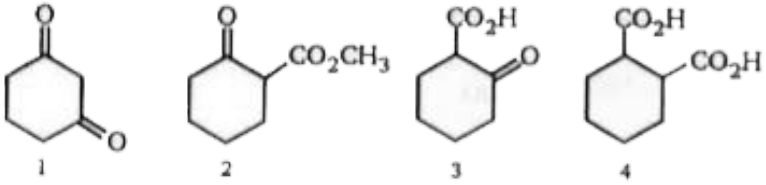
47. Which of the following compounds will undergo decarboxylation on heating ?



A. 2 and 3

B. 3 and 4

C. 3 only

D. 1 and 4

Answer: C

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48. Which one of the following is not an intermediate in the generally accepted mechanism for the reaction shown below ?

$$CF_3\overset{\overset{O}{||}}{C}OH + CH_3\underset{\underset{OH}{|}}{C}HCH_3 \xrightarrow{H_2SO_4} CF_3\overset{\overset{O}{||}}{C}O\underset{\underset{CH_3}{|}}{C}HCH_3 + H_2O$$

A. $CF_3\overset{\overset{+\ddot{O}H}{||}}{C} - \ddot{O}H$

B. $CF_3\overset{\overset{:\ddot{O}:^-}{|}}{\underset{\underset{:\ddot{O}H}{|}}{C}} - \ddot{O}H - \ddot{O}CH(CH_3)_2$

C. $CF_3\overset{\overset{:\ddot{O}H}{|}}{\underset{\underset{:\ddot{O}H_2}{|}}{C}} - \ddot{O}CH(CH_3)_2$

D. $CF_3 \overset{\overset{\cdot\cdot}{:OH}}{\underset{\underset{\cdot\cdot}{:OH_2}}{|}}{C} - \overset{\cdot\cdot}{\underset{\cdot\cdot}{O}}CH(CH_3)_2$

Answer: B

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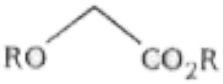
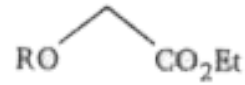
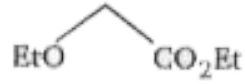
49. , Product

A is :

A. 

B. 

C. 

D. $R - O - \overset{\overset{O}{||}}{C} - O - Et$

Answer: B

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50. Identify the compound C in the following sequence:

$$(CH_3)_2CHCH_2C \equiv N \xrightarrow{HCl, H_2O} \text{compound A} \xrightarrow[2.H_2O]{1.LiAlH_4} \text{compound B} \xrightarrow[CH_2Cl_2]{P\mathbb{C}} C$$

A. $(CH_3)_2CH\overset{\overset{O}{||}}{C}CH_3$

B. $(CH_3)_2CHCH_2\overset{\overset{O}{||}}{C}OH$

C. $(CH_3)_2CHCH_2\overset{\overset{O}{||}}{C}H$

D. $(CH_3)_2CH\overset{\overset{O}{||}}{C}CH_2OH$

Answer: C

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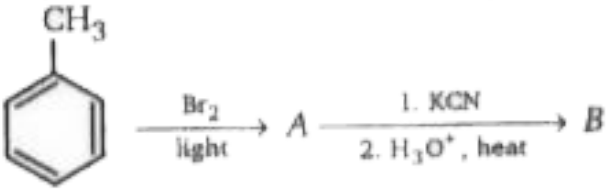
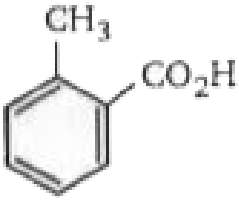
51. What is the final product (B) of this sequence ?

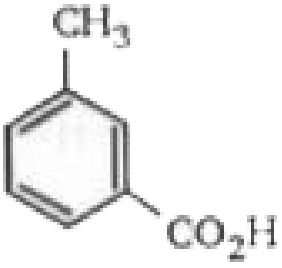


A.

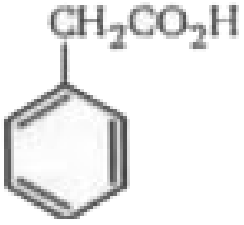


B.

C.



D.



Answer: D

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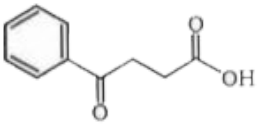
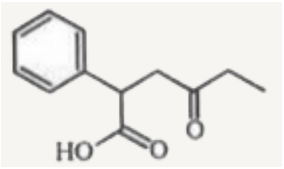
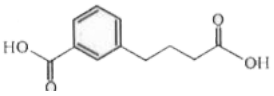
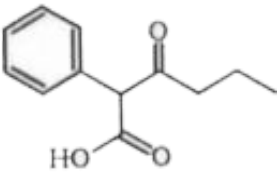
52. Which of the following undergoes decarboxylation most readily on being heated ?

A. 

B. 

C. 

D. 

Answer: D

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53. What is compound Z ?

A. $CH_3CH = Ch\overset{\overset{O}{||}}{C}OH$

B. $CH_3CH_2CH_2CH = NOCH_2CH_3$

C. $CH_3CH_2CH_2CH(OCH_2CH_3)_2$

D. $CH_3CH_2CH_2\overset{\overset{O}{||}}{C}OCH_2CH_3$

Answer: D

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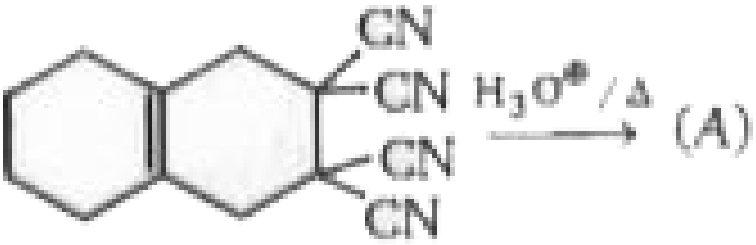
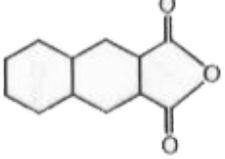
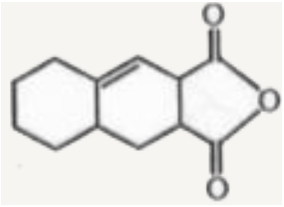
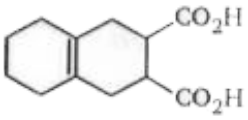


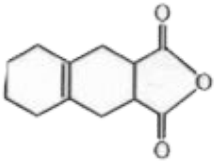
54. , Product

(A) of the reaction is :

A. 

B. 

C. 

D. 

Answer: D

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55. $CH_3 - CH = CH - CH_2 - CO_2H \xrightarrow[\Delta]{} (X)$(major), Product (X) is :

A. $CH_3 - CH = CH - CH_3$

B. $CH_3 - \underset{\underset{CH_3}{|}}{C} = CH_2$

C. $CH_3 - CH_2 - CH = CH_2$

D. $CH_3 - CH = CH_2$

Answer: C

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56. $H - O - \overset{\overset{O}{||}}{C} - (CH_2)_n - \overset{\overset{O}{||}}{C} - O - H \xrightarrow[\Delta]{}$ At what value of (n) given compound will not evolve CO_2 gas ?

A. n=5

B. n=4

C. n=2

D. n=1

Answer: C

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57. $\begin{matrix} CO_2H \\ | \\ CH_2 \\ | \\ CO_2H \end{matrix}_n$, If (n=4) then di-carboxylic acid would be known as :

A. malonic acid

B. Succinic acid

C. Adipic acid

D. Oxalic acid

Answer: C

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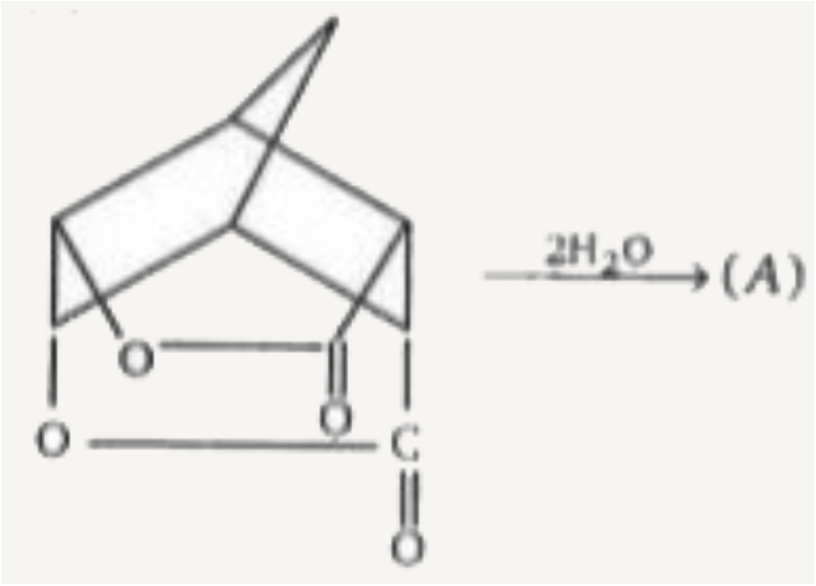
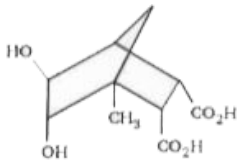
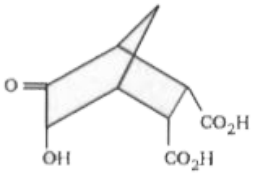
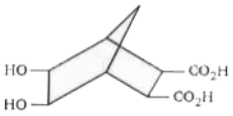
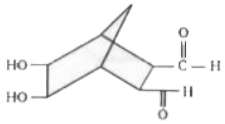
58. 

Product (A) of the above reaction is:

A. 

B. 

C. 

D. 

Answer: C

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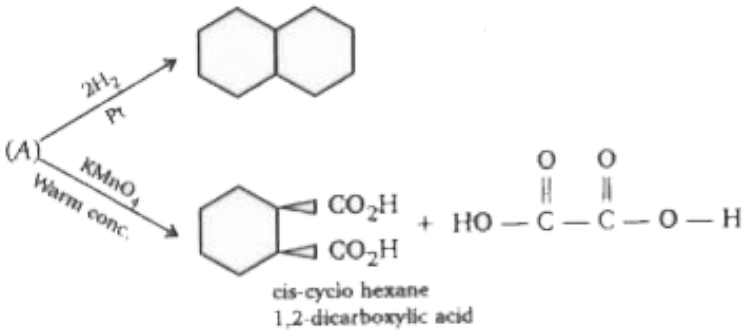
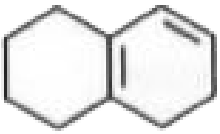
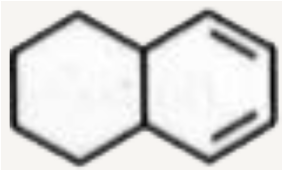
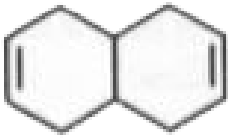


59.

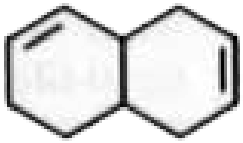
Identify (A).

A. 

B. 



C.



D.

Answer: B

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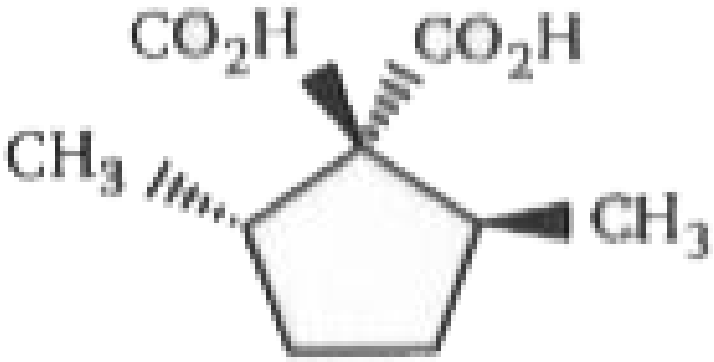

60. How many product will be formed when above compound undergo de-carboxylation ?

A. 0

B. 1

C. 2

D. 3

Answer: B

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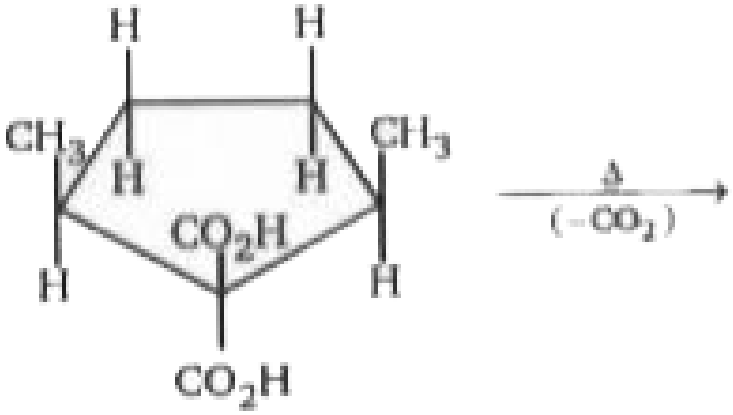
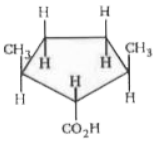
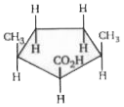


61.

Product of the reaction is :

A. 

B. 

C. both (a) and (b)

D. none of these

Answer: C

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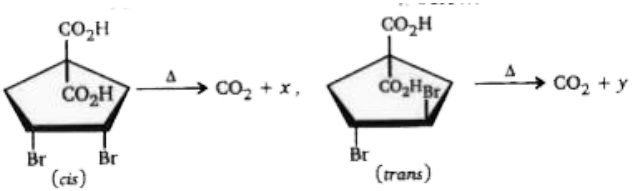
62. Products obtained in the given reactions are shown below



The number of possible products for x and y are :

A. 1,1

B. 1,2

C. 2,1

D. 2,2

Answer: C

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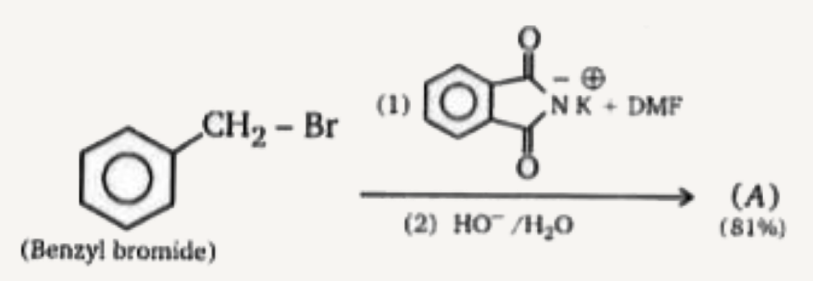
63. 

Product

(A) of the above reaction is :

A. $Ph - NH_2$

B. $Ph - CH_2 - NH_2$

C. $Ph - CH_2 - NH - CO_2H$

D. $Ph - CH_2 - NH - CHO$

Answer: B

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64. Which of the following pair is C_2 epimer ?

A. D-Glucose, D-Maltose

B. D-Glucose, D-Mannose

C. D-Allose D-Ribose

D. D-Glucose, D-Arabinose

Answer: B

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65. Total number of enol possible for the compound formed during given reaction will be (including stereoisomer):

$$CH_3MgBr + CH_3CH_2 - \overset{O}{\overset{||}{C}} - Cl \rightarrow$$

A. 2

B. 3

C. 4

D. 5

Answer: B

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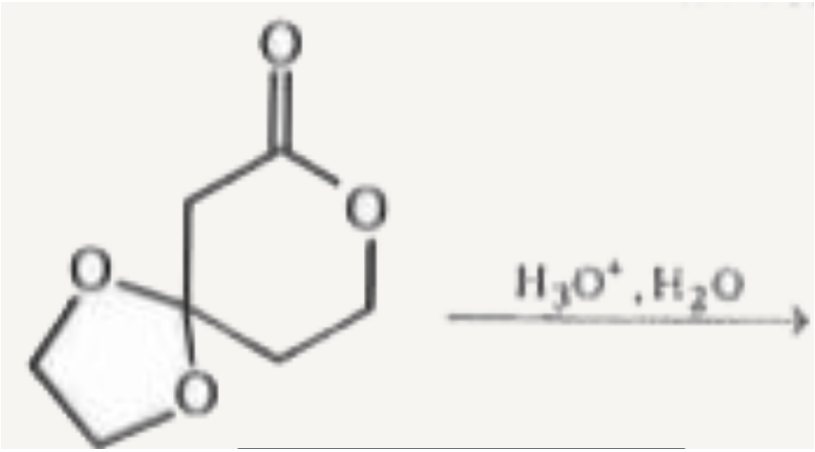
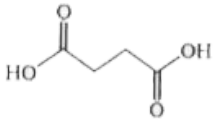
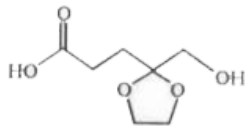
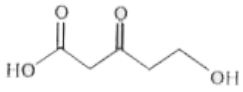
66. Which of the product of the following reaction?

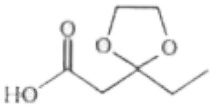


A.



B. 

C. 

D. 

Answer: C

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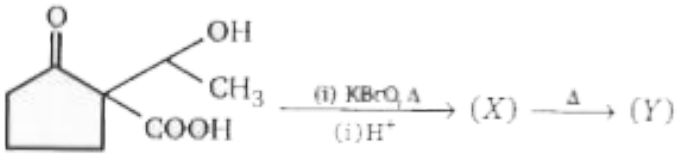
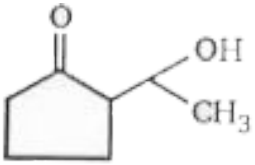
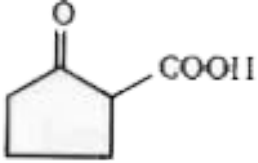
67. 

Hence the product(Y) in the above sequence of reactions is :

A. 

B.



C.

D.

Answer: C

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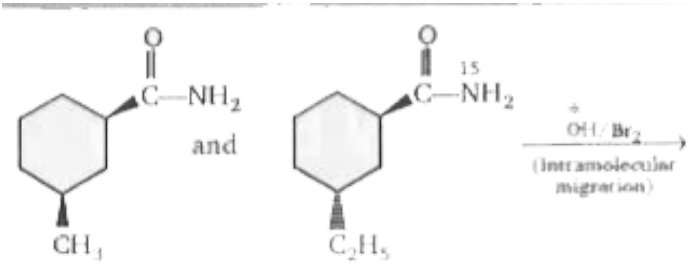
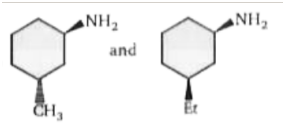
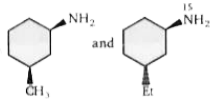
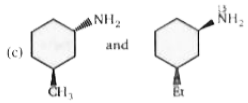
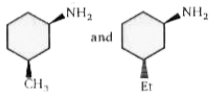


68. Product are :

A. 

B. 

C. 

D. 

Answer: B

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69.

$CH_3CH_2CH(OH)CH(CH_3)_2 + CH_3COCl \xrightarrow{\text{Base}} CH_3CH_2CH(OCOCH_3$

in the above reaction, if the reactant alcohol is pure R-isomers, the product would

A. have configuration inverted at the chiral atom

B. be a racemic mixture

C. have the same configuration at the chiral atom

D. be optically inactive

Answer: C

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70. The order of S_N1 reactivity in aqueous acetic acid solution for the compounds

$$\underset{(1)}{H_3C - \overset{\overset{O}{||}}{C} - CH_2 - Cl} \qquad \underset{(2)}{H_3C - CH_2 - CH_2 - Cl} \qquad \underset{(3)}{(H_3C)_3C - Cl}$$

A. $1 > 2 > 3$

B. $1 > 3 > 2$

C. $3 > 2 > 1$

D. $3 > 1 > 2$

Answer: C

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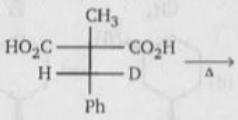
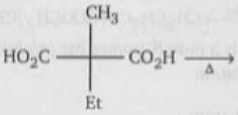
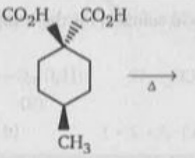
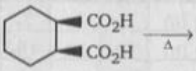
Level 2

1. Match the column (I) and (II) (Matrix)

Column (I)		Column (II)	
Reaction		Products formed	
(a)		(p)	Diastereomers
(b)		(q)	Racemic mixture
(c)		(r)	Meso compound
(d)		(s)	CO_2 gas will evolve

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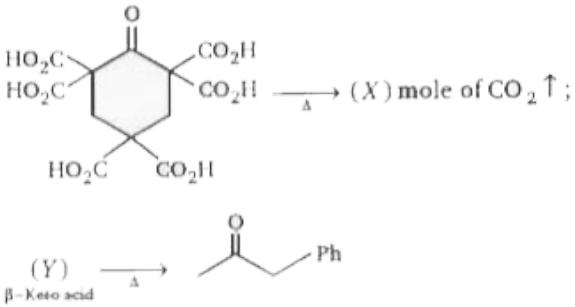
Level 2 Subjective Problems

1.



(Y) is including stereoisomers. Value of (X+Y) will be

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