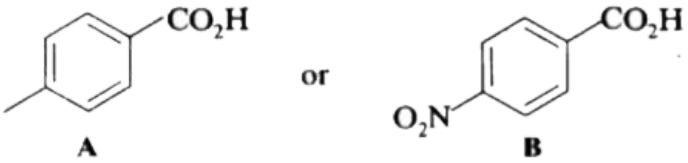
CHEMISTRY

BOOKS - MS CHOUHAN CHEMISTRY (HINGLISH)

CARBOXYLIC ACIDS AND THEIR DERIVATIVES

Solved Problem

1. Which carboxylic acid would ou expect to be stronger A or B ?



A B

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2. Suggest epxplanation for the following

The pK_{a1} for all of the dicarboxylic acids in Table 17.2 is smaller tyhan the pK_a for a

monocarboxylic acid with the same number of carbon atoms.

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3. Suggest epxplanation for the following

The difference between pK_{a1} and pK_{a2} for dicarboxylic acid of the type $HO_2C(CH_2)_nCO_2H$ decreases as n increases.

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4. N,N-Diethyl-3-methylbenzamide (also called N,N-diethyl-m-toluamide. Or DEET) is used many insect repellants. Write its structure.

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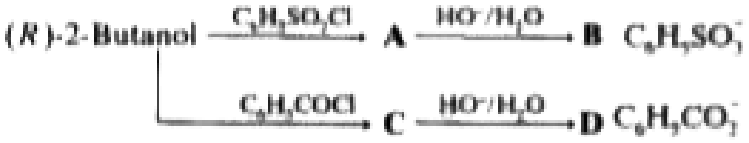
5. Give stereochemical formulas for A-D. are enantiomers of each of other.



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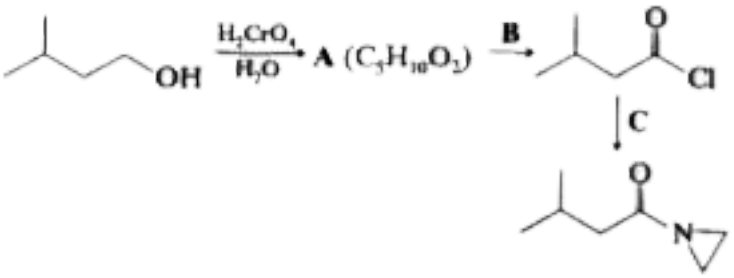
6. Provide the missing compound A-C, in the following synthesis



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7. At first glance the conversion of bromobenzene to benzenitrile looks simple just cary out a nucleophilic substitution using

cyanide ion as the nucleophile. Then we remember that bromobenzene does not undergo either an S_N1 or an S_N2 reaction (Section 6.14A). The conversion can be accomplishes. however. thogh it involves severals steps. Outline possible steps.

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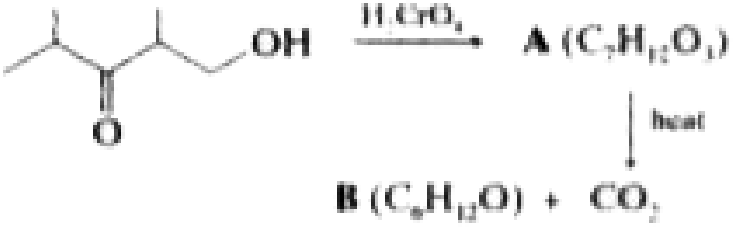
8. Provide structures for A and B.



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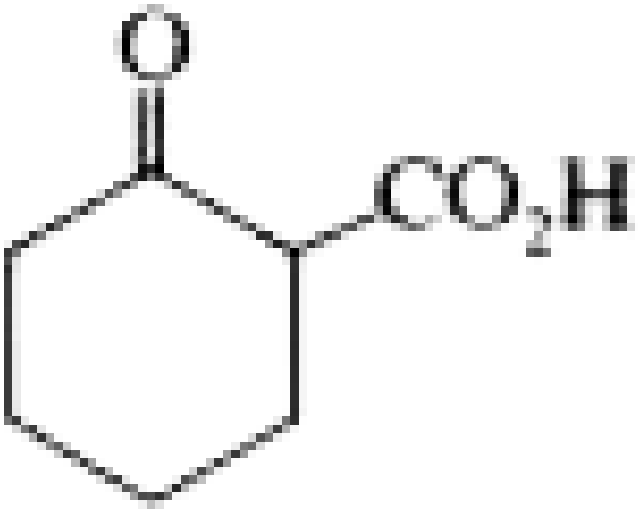
9. Identify the product obtained when following acids, undergo prolonged heating,



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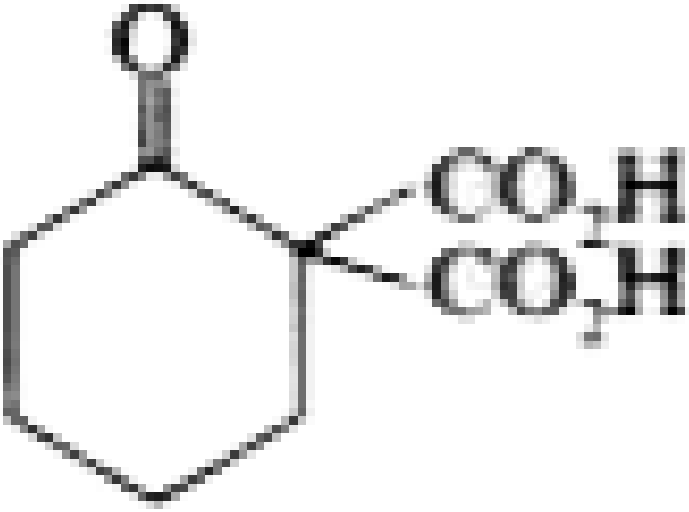
10. Identify the product obtained when following acids, undergo prolonged heating,



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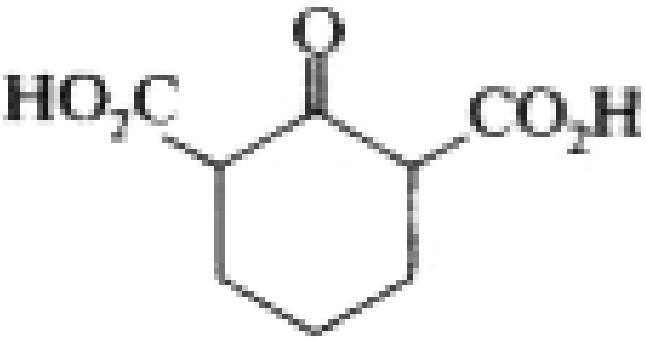
11. Identify the product obtained when following acids, undergo prolonged heating,



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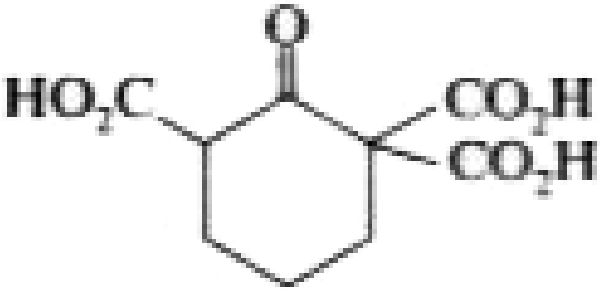
12. Identify the product obtained when following acids, undergo prolonged heating,



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13. Identify the product obtained when following acids, undergo prolonged heating,

$$PH - \overset{O}{\overset{||}{C}} - CH_2 - \overset{O}{\overset{||}{C}} - OH$$

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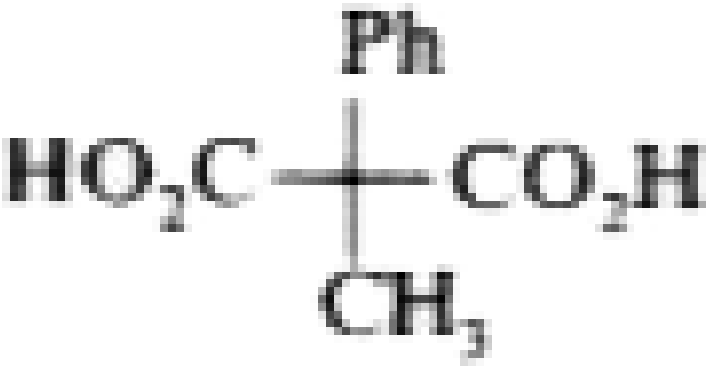
14. Identify the product obtained when following acids, undergo prolonged heating,



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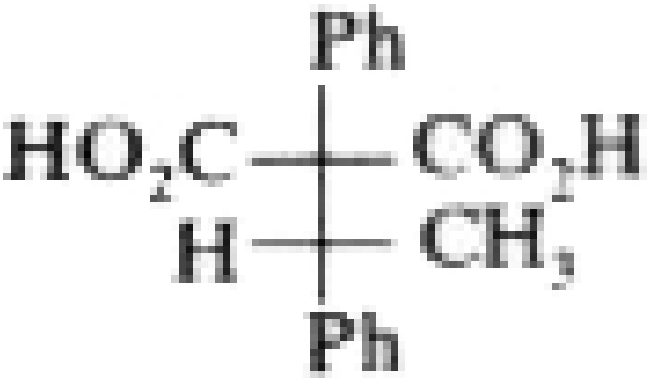
15. Identify the product obtained when following acids, undergo prolonged heating,



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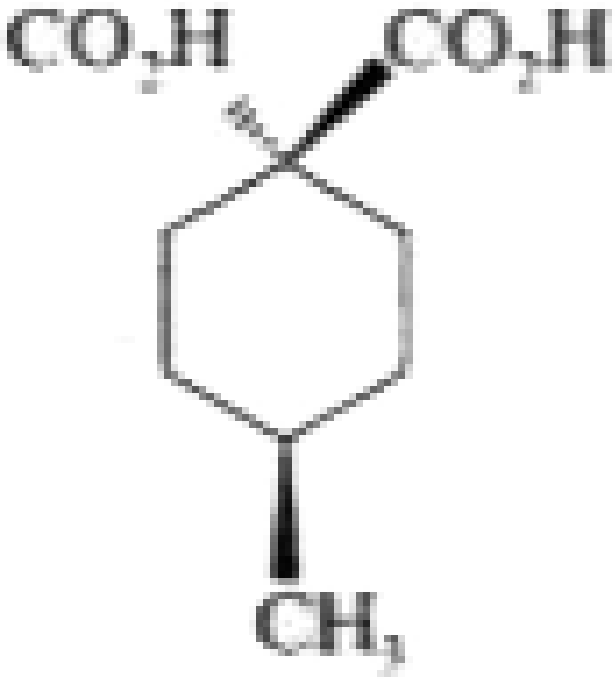
16. Identify the product obtained when following acids, undergo prolonged heating,



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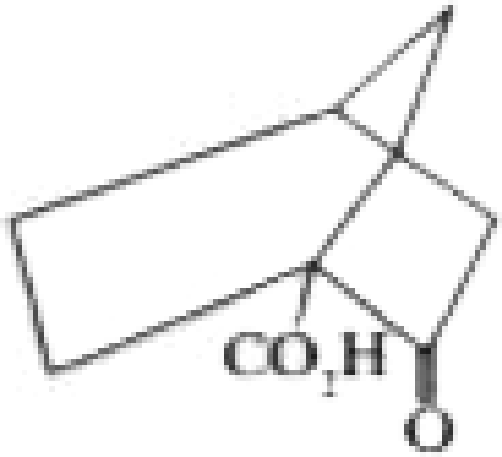
17. Following β ketoacid will not undergo decarboxylation on heating Give reasons.



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18. Provided detailed curved arrow mechanisms for the following reactions:

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19. Provided detailed curved arrow mechanisms for the following reactions:

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20. Provided detailed curved arrow mechanisms for the following reactions:

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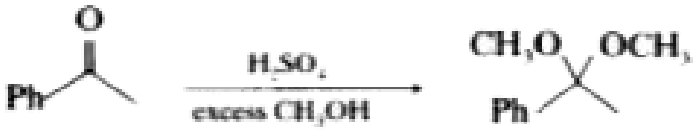
21. Provided detailed curved arrow mechanisms for the following reactions:



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22. Provided detailed curved arrow mechanisms for the following reactions:

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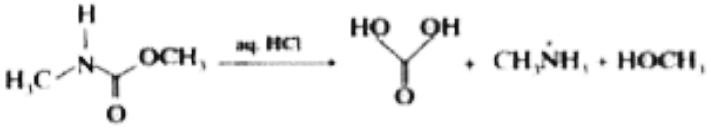
23. Provided detailed curved arrow mechanisms for the following reactions:



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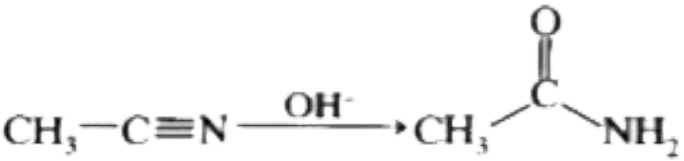
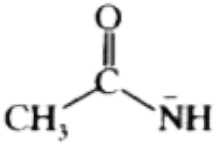
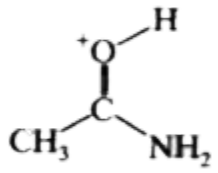
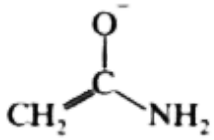
Additional Objective Questions Single Correct Choice Type

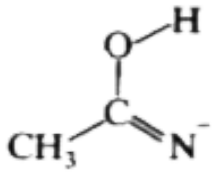
1. Choose the structure that is an intermediate in the base catalyzed hydrolysis of acetonitrile into acetamide.



A. 

B. 

C. 

D. 

Answer: D

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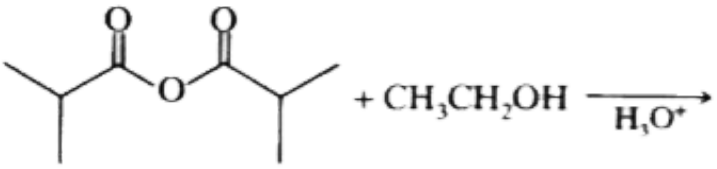
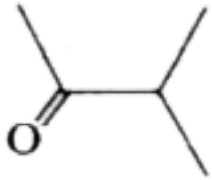
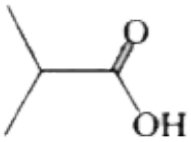
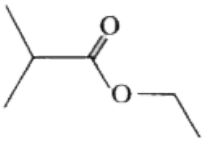
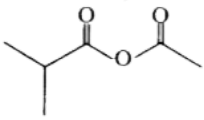
2. What is the major product of the following reaction?



A. 

B. 

C. 

D. 

Answer: C

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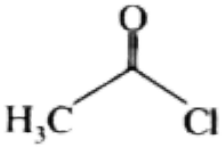
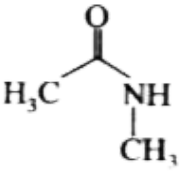
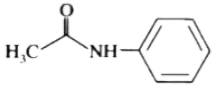
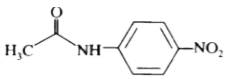
3. Which of the following are most reactive compounds for nucleophilic acyl substitution?

A. 

B. 

C. 

D. 

Answer: D

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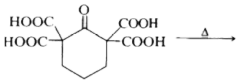
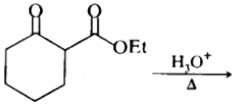
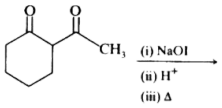
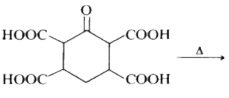
4. Which of the following reaction do not yield cyclohexanone as major product?

A. 

B. 

C. 

D. 

Answer: D

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5. Which of the following carboxylic acids undergo decar boxylation easily?

A. $C_6H_5CO - CH_2COOH$

B. $C_6H_5CO - COCOOH$

C. $C_6H_5 - \underset{\underset{OH}{|}}{CH_2} - COOH$

D. $C_6H_5\underset{\underset{NH_2}{|}}{CH_2} - COOH$

Answer: A

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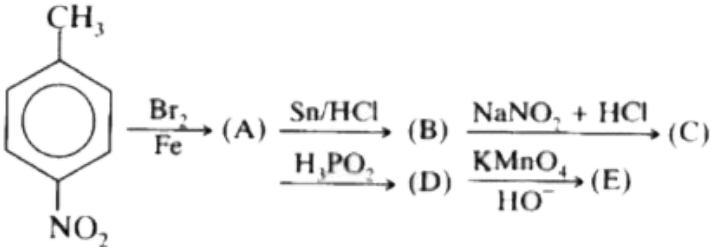
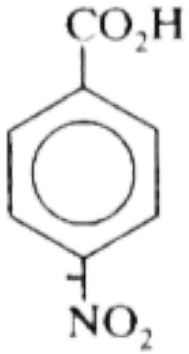
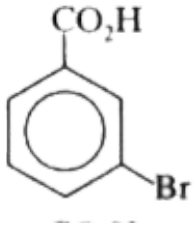
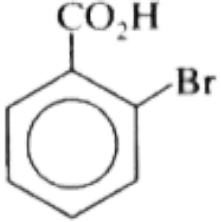
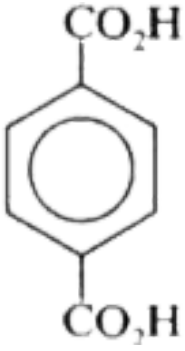
6. 

A. 

B. 

C. 

D. 

Answer: C

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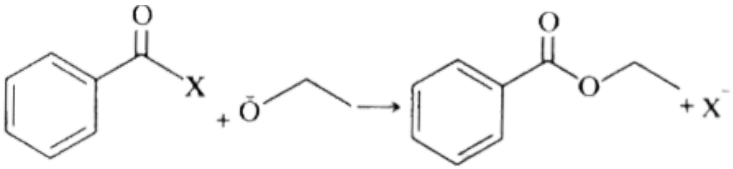
7. Choose the order that has the following benzoyl compounds correctly arranged with

respect to increasing reactivity.



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

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

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

D. $(i) < (iii) < (i)$

Answer: B

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8. When propionic acid is treated with aqueous $NaHCO_3$, CO_2 is liberated. The .C. of CO_2 comes from

A. methyl group

B. carboxylic acid group

C. methylene group

D. bicarbonate.

Answer: D

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9. Which of the following carboxylic acids will have the largest K_a value ?

A. CH_3CO_2H

B. $ClCH_2CO_2H$

C. $C_6H_5CO_2H$

D. CF_3CO_2H

Answer: D

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10. The reactivity of carboxylic acid derivatives from highest reactivity to lowest reactivity is

A. acid anhydride > acid chloride > ester > amide

B. acid chloride > acid anhydride > ester > amide

C. acid anhydride > ester > amide > acid chloride

D. amide > ester > acid anhydride > acid chloride

Answer: B

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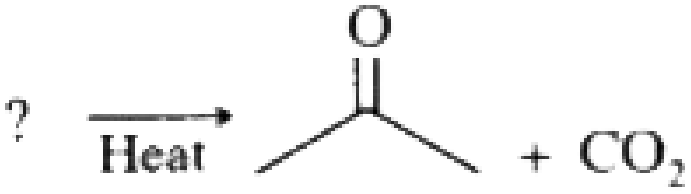
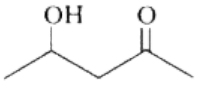
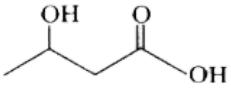
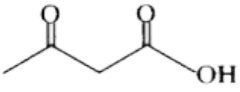
11. What starting material is required for the following reaction?



A. 

B. 

C. 

D. 

Answer: D

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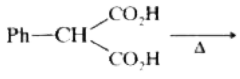
12. In which of the reaction CO_2 gas will evolve?

A. $Ph - \overset{\overset{O}{||}}{C} - CH_2 - \overset{\overset{O}{||}}{C} - OH \xrightarrow[\Delta]{}$

B. 

C. $Ph - CO_2H \xrightarrow[\Delta]{NaHCO_3}$

D. All

Answer: D

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13. $Ph - \underset{14}{\overset{\overset{O}{||}}{C}} - OH \xrightarrow{NaHCO_3 / \Delta} (A)$

A. CO_2

B. $^{14}CO_2$

C. H_2

D. NH_3

Answer: A

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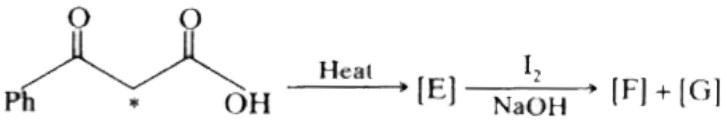
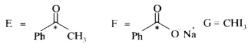
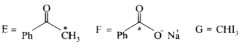
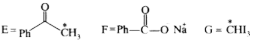
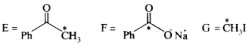
14. In the following reaction sequence, the correct structures of E, F and G are



A. 

B. 

C. 

D. 

Answer: C

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15. The product of mixing an acyl halide and an acid is

A. an acid

B. an amide

C. anhydride

D. an aldehyde

Answer: C

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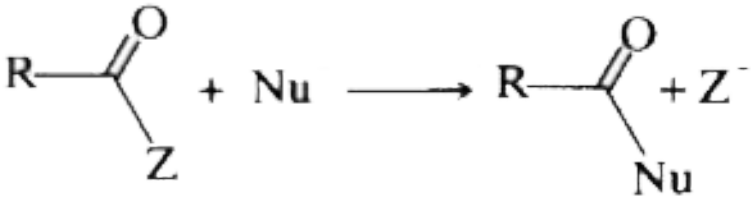


16.

A. Cl

B. $OCOCH_3$

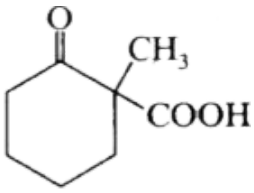
C. OC_2H_5

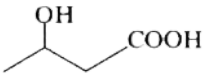
D. NH_2

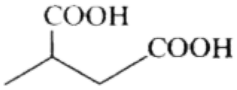
Answer: A

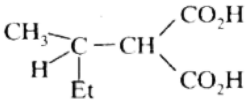
View Text Solution

17. Which of the following lossses chirality when heated ?

A. 

B. 

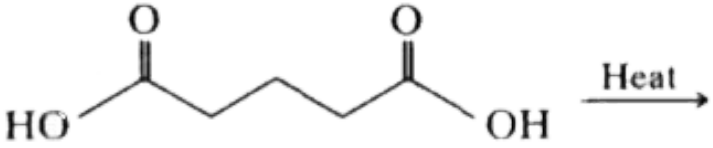
C. 

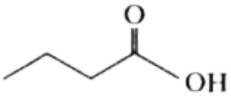
D. 

Answer: B

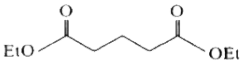
View Text Solution

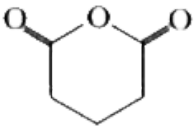
18. What is the productof the following reaction ?



A. 

B. 

C. 

D. 

Answer: D

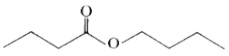
View Text Solution

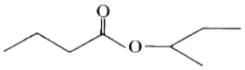
Additional Objective Questions Linked Comprehension Type Paragraph For Questions

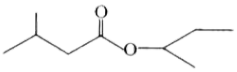
1. 4 A neutral, resolvable organic compound A has molecular formula $(C_8H_{16}O_2)$. A on treatment with $LiAlH_4$ gives isomeric B and $C(C_4H_{10}O)$ of which only B is optically active. B on treatment with acidified dichromate solution gives $D(C_4H_8O)$, which on refluxing with dilute NaOH followed by acidification of

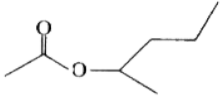
product gave $E(C_8H_{14}O)$. E on heating with N_2H_4 in alkaline medium affords $F(C_8H_{16})$ which on treatment with B.H/H,O,/HO produced a resolvable G $(C_8H_{18}O)$. G on treatment with acidified dichromate solution produced $H(C_8H_{16}O)$, which on treatment with MCPBA produces A.

Compound (A) is

A. 

B. 

C. 

D. 

Answer: B

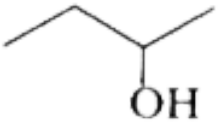
View Text Solution

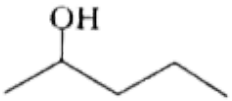
2. 4 A neutral, resolvable organic compound A has molecular formula $(C_8H_{16}O_2)$. A on treatment with $LiAlH_4$ gives isomeric B and $C(C_4H_{10}O)$ of which only B is optically active. B on treatment with acidified dichromate solution gives $D(C_4H_8O)$, which on refluxing

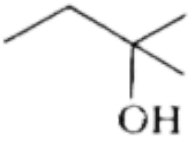
with dilute NaOH followed by acidification of product gave $E(C_8H_{14}O)$. E on heating with N_2H_4 in alkaline medium affords $F(C_8H_{16})$ which on treatment with B.H/H,O,/HO produced a resolvable G $(C_8H_{18}O)$. G on treatment with acidified dichromate solution produced $H(C_8H_{16}O)$, which on treatment with MCPBA produces A.

Compound (B) is

A. 

B. 

C. 

D. 

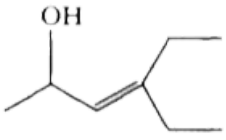
Answer: B

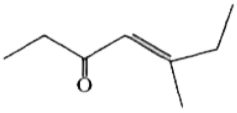
View Text Solution

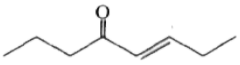
3. 4 A neutral, resolvable organic compound A has molecular formula $(C_8H_{16}O_2)$. A on treatment with $LiAlH_4$ gives isomeric B and $C(C_4H_{10}O)$ of which only B is optically active.

B on treatment with acidified dichromate solution gives $D(C_4H_8O)$, which on refluxing with dilute NaOH followed by acidification of product gave $E(C_8H_{14}O)$. E on heating with N_2H_4 in alkaline medium affords $F(C_8H_{16})$ which on treatment with B.H/H,O,/HO produced a resolvable G $(C_8H_{18}O)$. G on treatment with acidified dichromate solution produced $H(C_8H_{16}O)$, which on treatment with MCPBA produces A.

Compound (E)

A. 

B. 

C. 

D. None of these

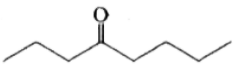
Answer: B

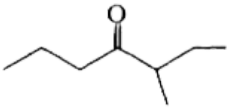
View Text Solution

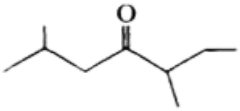
4. 4 A neutral, resolvable organic compound A has molecular formula $(C_8H_{16}O_2)$. A on treatment with $LiAlH_4$ gives isomeric B and $C(C_4H_{10}O)$ of which only B is optically active.

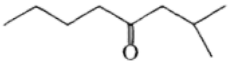
B on treatment with acidified dichromate solution gives $D(C_4H_8O)$, which on refluxing with dilute NaOH followed by acidification of product gave $E(C_8H_{14}O)$. E on heating with N_2H_4 in alkaline medium affords $F(C_8H_{16})$ which on treatment with B.H/H,O,/HO produced a resolvable G $(C_8H_{18}O)$. G on treatment with acidified dichromate solution produced $H(C_8H_{16}O)$, which on treatment with MCPBA produces A.

Compound (H) is

A. 

B. 

C. 

D. 

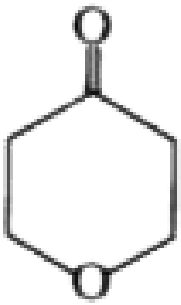
Answer: B

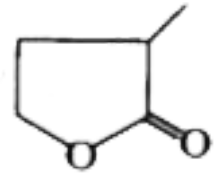
View Text Solution

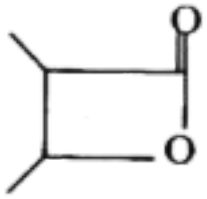
5. A neutral organic compound $A(C_5H_8O_2)$ does not decolorize Bayer.s reagent and on hydrolysis with dilute H_2SO_4 produces

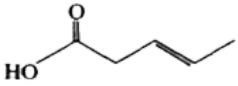
$B(C_2H_{10}O_3)$, which is diastereomeric. B on heating with concentrated H_2SO_4 undergoes dehydration producing $C(C_5H_8O_2)$, which shows geometrical isomerism. Also B on treatment with acidic dichromate solution produced $D(C_5H_8O_2)$, which is enantiomeric and gives a yellow precipitate with NaOI. D on gentle heating produces E (C_4H_8O),which is non-resolvable.

Compound (A) is

A. 

B. 

C. 

D. 

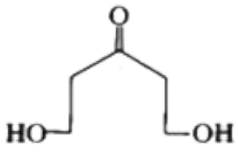
Answer: C

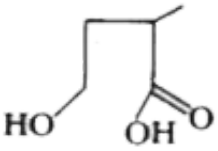
View Text Solution

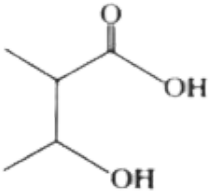
6. A neutral organic compound $A(C_5H_8O_2)$ does not decolorize Bayer.s reagent and on hydrolysis with dilute H_2SO_4 produces $B(C_2H_{10}O_3)$, which is diastereomeric. B on heating with concentrated H_2SO_4 undergoes dehydration producing $C(C_5H_8O_2)$, which shows geometrical isomerism. Also B on treatment with acidic dichromate solution produced $D(C_5H_8O_2)$, which is enantiomeric and gives a yellow precipitate with NaOI. D on gentle heating produces E (C_4H_8O),which is

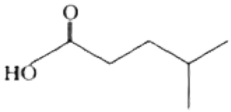
non-resolvable.

Compound (B) is

A. 

B. 

C. 

D. 

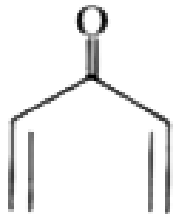
Answer: C

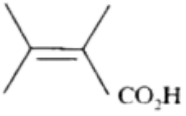
View Text Solution

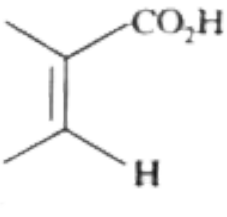
7. A neutral organic compound $A(C_5H_8O_2)$ does not decolorize Bayer.s reagent and on hydrolysis with dilute H_2SO_4 produces $B(C_2H_{10}O_3)$, which is diastereomeric. B on heating with concentrated H_2SO_4 undergoes dehydration producing $C(C_5H_8O_2)$, which shows geometrical isomerism. Also B on treatment with acidic dichromate solution produced $D(C_5H_8O_2)$, which is enantiomeric and gives a yellow precipitate with NaOI. D on gentle heating produces E (C_4H_8O),which is

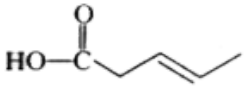
non-resolvable.

Compound (C) is

A. 

B. 

C. 

D. 

Answer: C

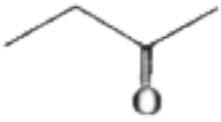
View Text Solution

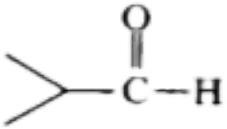
8. A neutral organic compound $A(C_5H_8O_2)$ does not decolorize Bayer.s reagent and on hydrolysis with dilute H_2SO_4 produces $B(C_2H_{10}O_3)$, which is diastereomeric. B on heating with concentrated H_2SO_4 undergoes dehydration producing $C(C_5H_8O_2)$, which shows geometrical isomerism. Also B on treatment with acidic dichromate solution produced $D(C_5H_8O_2)$, which is enantiomeric and gives a yellow precipitate with NaOI. D on

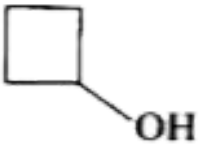
gentle heating produces E (C_4H_8O),which is non-resolvable.

Compound (E)is

A. 

B. 

C. 

D. 

Answer: B

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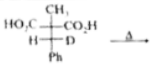
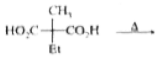
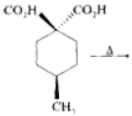
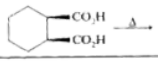
Additional Objective Questions Matrix Match Type

1.

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

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