

Organic Chemistry

Carey/Giuliano

10th edition

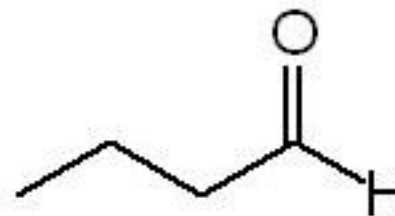
Chapter 19

[Question 1]

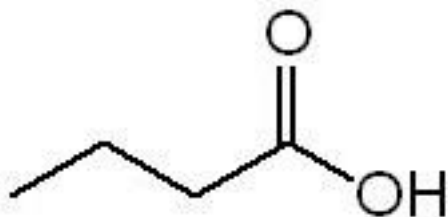
Which compound has the highest boiling point?



B)



C)

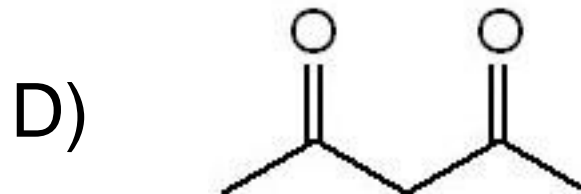
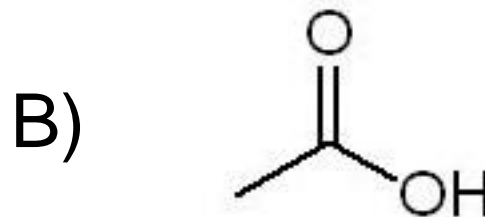
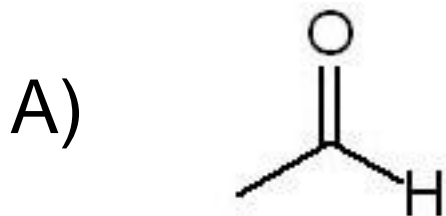


D)



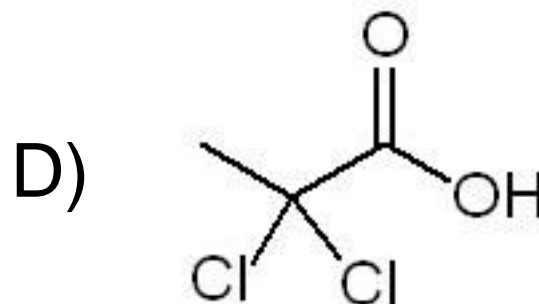
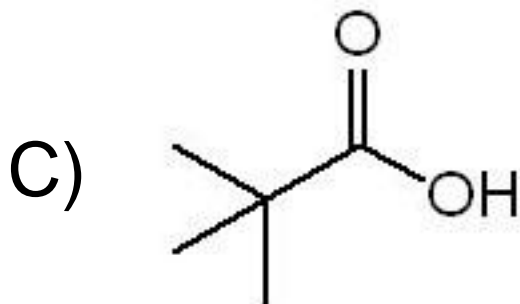
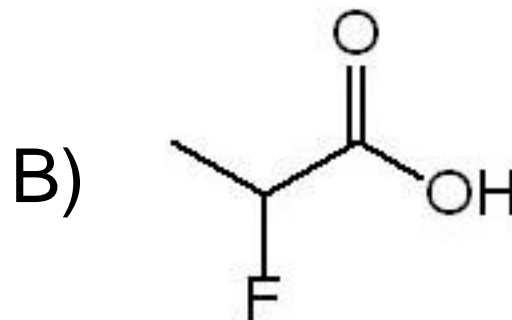
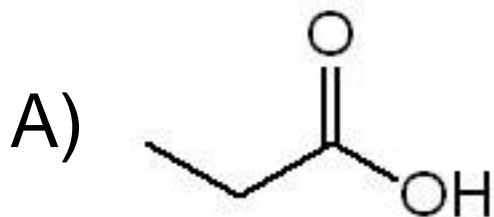
[Question 2]

Which compound has the lower pK_a (i.e., is more acidic)?



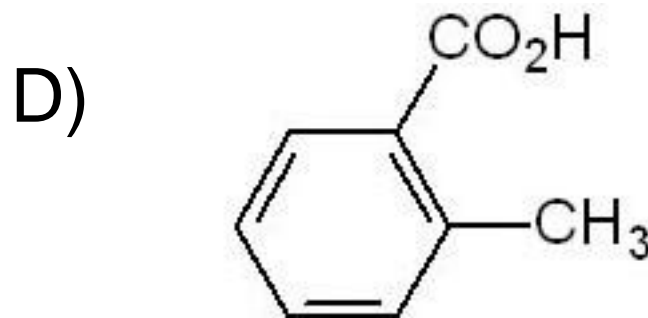
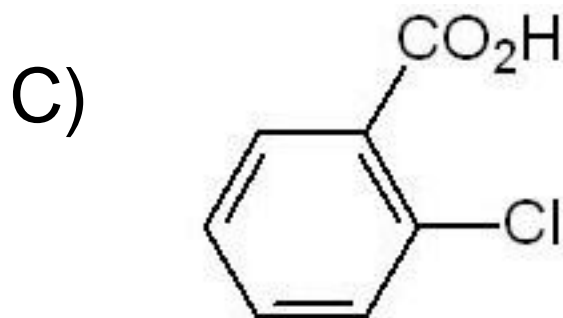
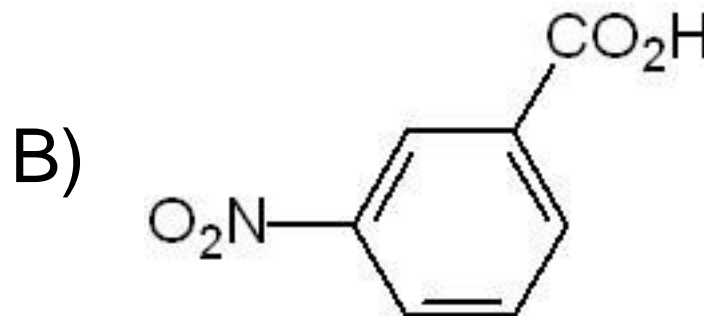
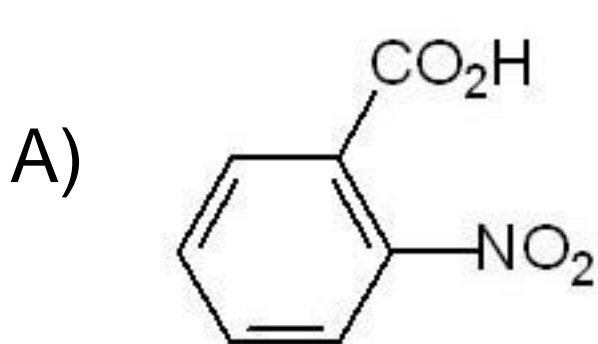
[Question 3]

Which one of the following compounds is more acidic?



[Question 4]

Which one of the following compounds has the highest pK_a ?



[Question 5]

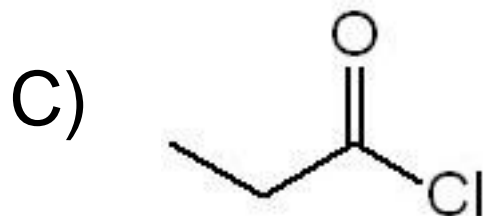
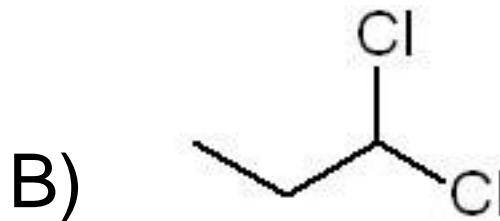
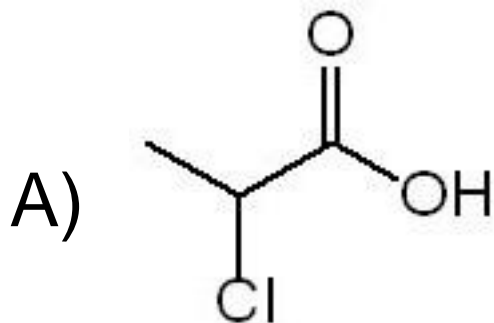
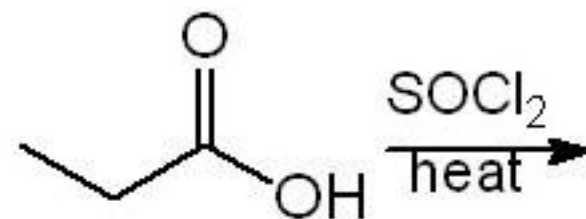
What is the major organic product of the reaction of propylmagnesium bromide with CO_2 followed by addition of dilute acid?



- A) propanoic acid
- B) butanoic acid
- C) butanol
- D) propane

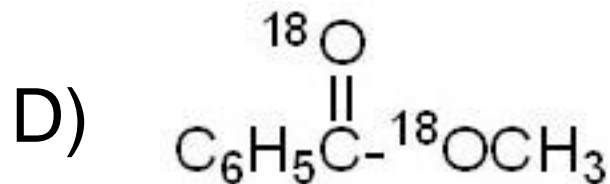
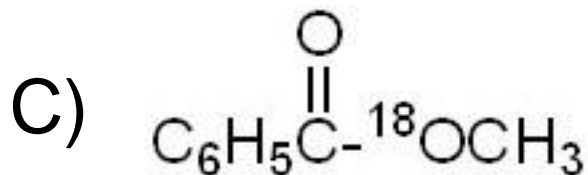
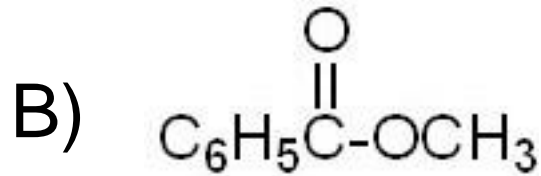
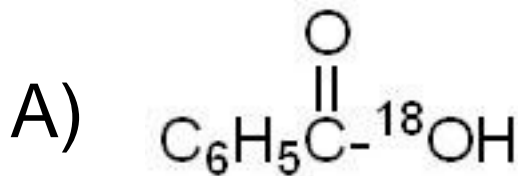
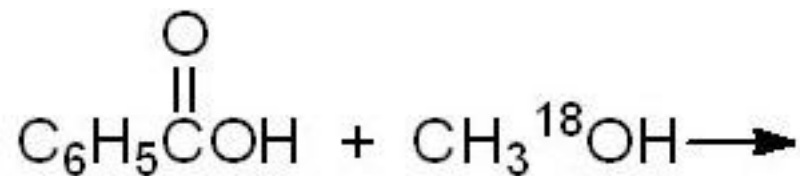
Question 6

Select the product of the reaction of propanoic acid with thionyl chloride



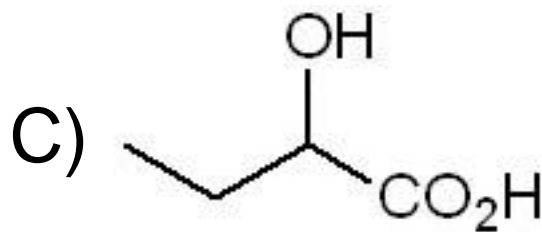
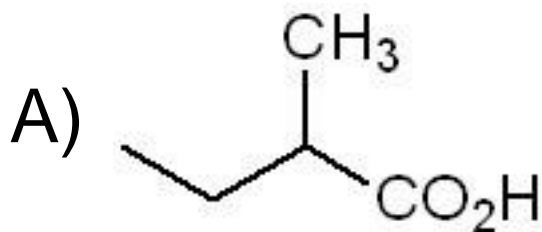
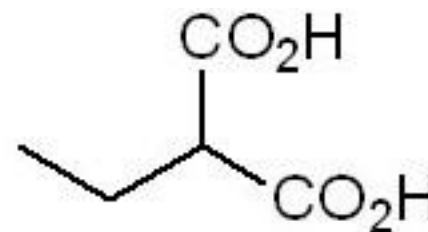
Question 7

When benzoic acid reacts with ^{18}O -enriched methanol ($\text{CH}_3^{18}\text{OH}$), which product will be obtained?



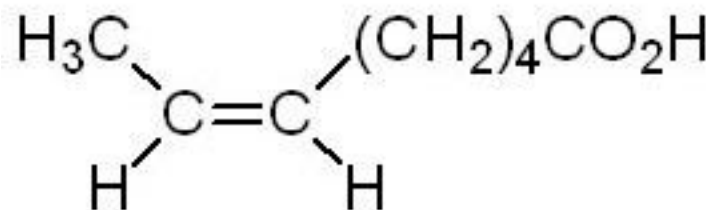
Question 8

Which of the following is the thermal decarboxylation product of the compound on the right?



[Question 9]

What is the IUPAC name of the carboxylic acid at the right?



- A) *cis*-3-pentenoic acid
- B) *trans*-6-octenoic acid
- C) *cis*-6-octenoic acid
- D) *trans*-6-octenoic acid

Question 10

Which set of reagents would be best to convert propanol into butanoic acid?

- A) $\text{Na}_2\text{Cr}_2\text{O}_7$, H_2SO_4
- B) PBr_3 ; Mg, diethyl ether; CO_2 ; H_3O^+
- C) HBr ; Mg, diethyl ether; H_3O^+
- D) conc. H_2SO_4 , heat; O_3 ; Zn, HCl

Question 11

Compound A has a molecular formula of $C_4H_8O_3$. Identify A on the basis of its 1H -NMR spectra: δ 1.3 (3H, triplet); 3.6 (2H, quartet); 4.1 (2H, singlet); 11.1 (1H, broad singlet).

- A) $CH_3CH_2OCH_2CO_2H$
- B) $CH_3OCH_2CH_2CO_2H$
- C) $HOCH_2CH_2CH_2CO_2H$
- D) $CH_3CH_2CO_2CH_3$

Question 12

Compound B has a molecular formula of $C_4H_8O_3$. Identify B on the basis of its 1H -NMR spectra: δ 2.6 (2H, triplet); 3.4 (3H, singlet); 3.7 (2H, triplet); 11.3 (1H, broad singlet).

- A) $CH_3CH_2OCH_2CO_2H$
- B) $HOCH_2CH_2CH_2CO_2H$
- C) $CH_3OCH_2CH_2CO_2H$
- D) $CH_3CH_2CO_2CH_3$

Question 13

Which of the following statements is true regarding the effect of substituents on the acidity of carboxylic acids?

- A) Alkyl substituents have a negligible effect on acidity.
- B) Electron-attracting groups increase acidity.
- C) Substituents on the α -carbon increase acidity.
- D) All of the statements above are true.

Question 14

Which of the following reactions proceeds via an enol intermediate?

- A) reaction of butylmagnesium bromide with benzaldehyde
- B) decarboxylation of $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}(\text{CO}_2\text{H})_2$ on heating
- C) formation of a lactone by cyclization of 5-hydroxypentanoic acid
- D) reaction of cyclopentanone with HCN (NaCH , H^+)

[Question 15]

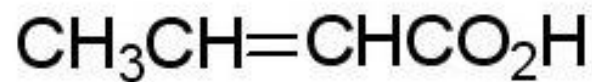
Rank the following substances in order of decreasing acid strength (strongest → weakest).



1



2



3

A) 1 > 2 > 3

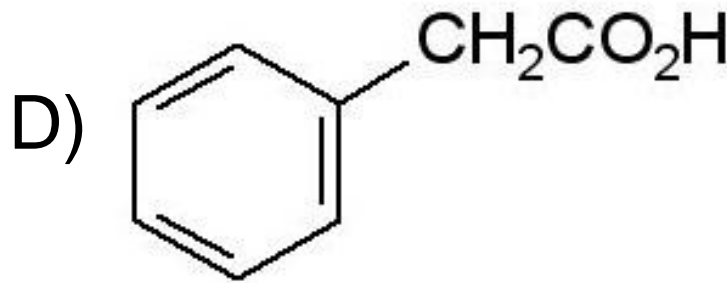
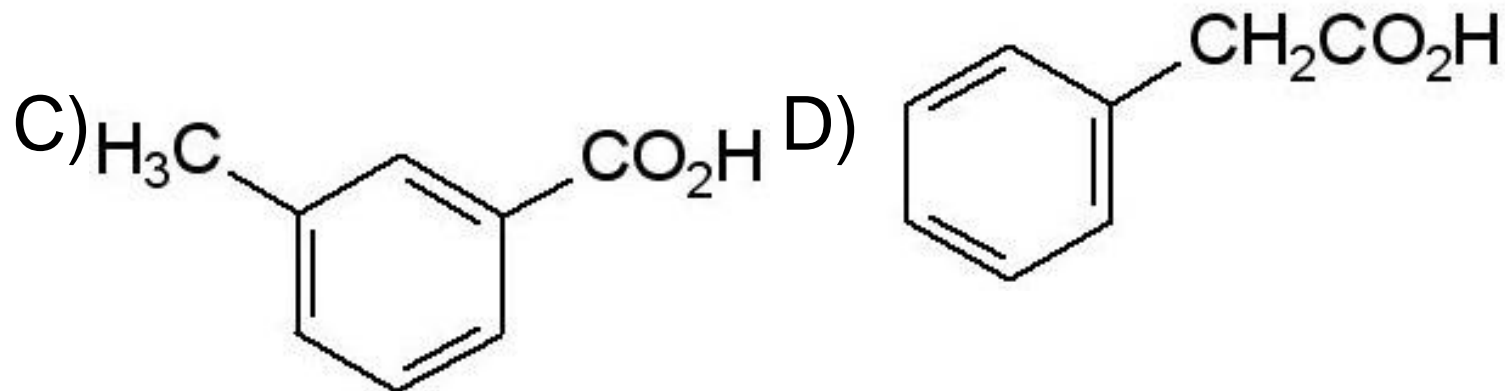
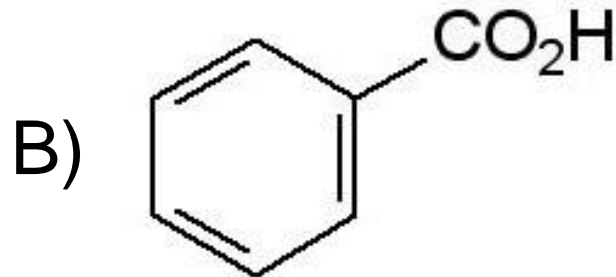
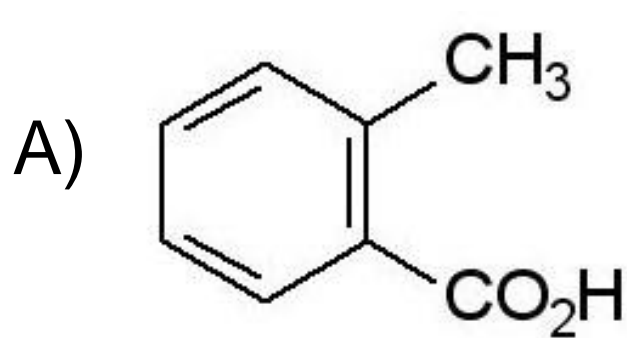
B) 2 > 3 > 1

C) 3 > 2 > 1

D) 3 > 1 > 2

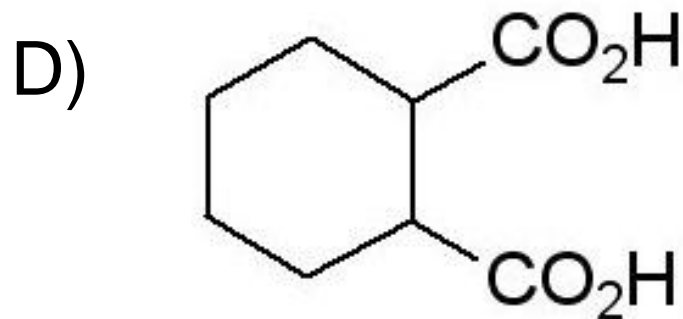
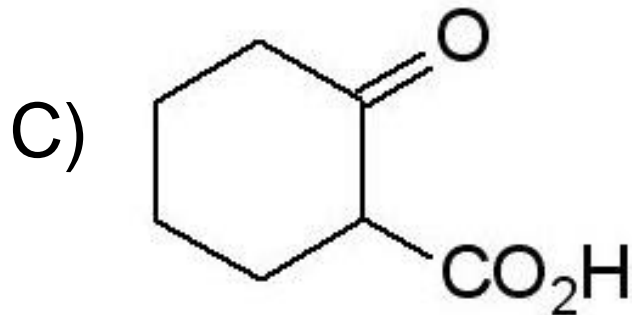
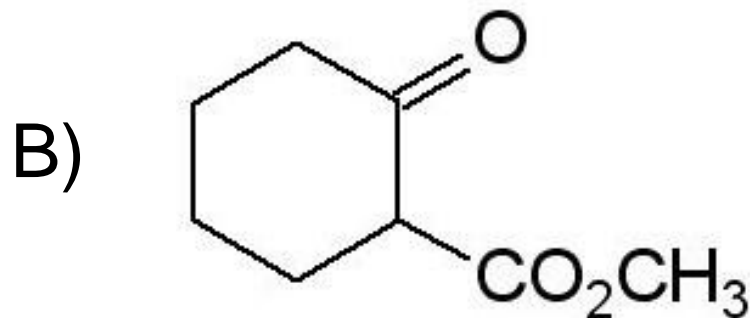
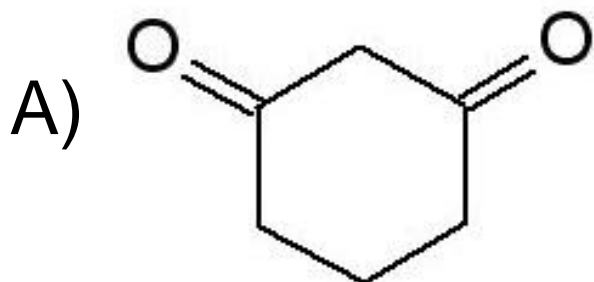
[Question 16]

If toluene reacts with 1) Br_2 ; then 2) KCN ; then 3) H_3O^+ , heat, the product isolated will be:



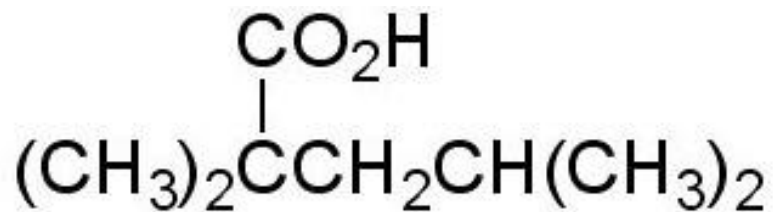
[Question 17]

Which of the following will undergo decarboxylation on heating?



Question 18

Which is the correct IUPAC name for the compound shown?



- A) 1,1,3-trimethylpentanoic acid
- B) 2,2,4-trimethylpentanoic acid
- C) 2,4-dimethyl-2-pentylcarboxylic acid
- D) 2,4-dimethyl-2-pentanoic acid

[Answer Key – Chapter 19]

1. C

2. B

3. D

4. C

5. B

6. C

7. C

8. B

9. C

10. B

11. A

12. C

13. D

14. C

15. B

16. D

17. C

18. B