

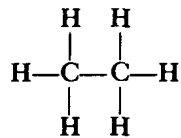
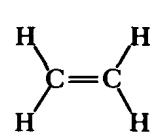
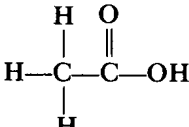
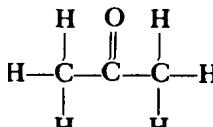
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## Unit 11 Organic Chemistry

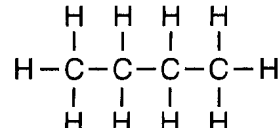
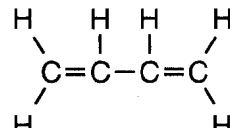
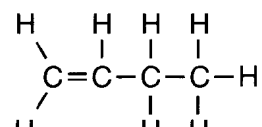
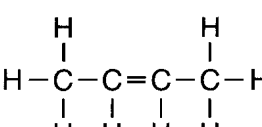
1. Which compound is a member of the same homologous series as  $C_3H_8$ ?

- A)  $CH_4$                       B)  $C_4H_8$   
C)  $C_5H_8$                       D)  $C_5H_{10}$

2. Which formula represents an unsaturated hydrocarbon?

- A)  B) 
- C)  D) 

3. Which formula represents 2-butene?

- A)  B) 
- C)  D) 

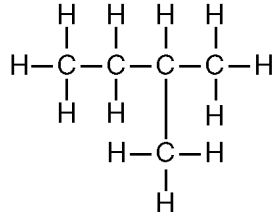
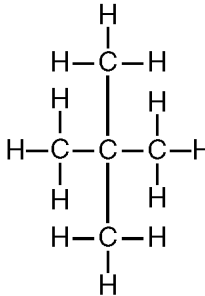
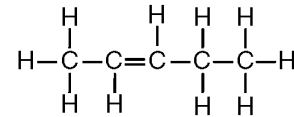
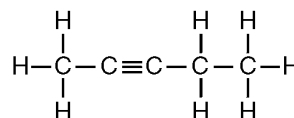
4. Given the structural formula:



What is the total number of electrons shared in the bond between the two carbon atoms?

- A) 6      B) 2      C) 3      D) 4

5. Which structural formula represents 2-pentyne?

- A)  B) 
- C)  D) 

6. Organic compounds that are essentially non-polar and exhibit weak intermolecular forces have

- A) low vapor pressure  
B) **low melting points**  
C) high boiling points  
D) high electrical conductivity in solution

7. In a given homologous series of hydrocarbons, the boiling point generally increases as the size of the molecules increases. The best explanation for this statement is that in larger organic molecules

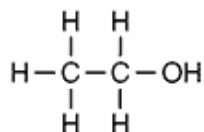
- A) the number of covalent bonds per molecule is greater  
B) the molecules are more symmetrical  
C) more hydrogen bonding is possible  
D) **there are greater intermolecular forces**

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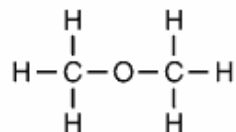
## Unit 11 Organic Chemistry

8. Given the structural formulas:

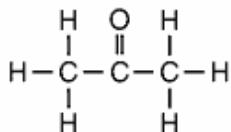
Formula A



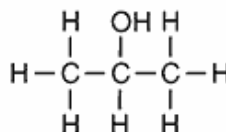
Formula B



Formula C



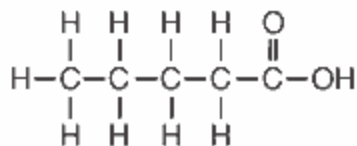
Formula D



Which two formulas represent compounds that are isomers of each other?

- A) A and B      B) A and C      C) B and D      D) C and D

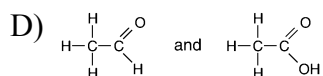
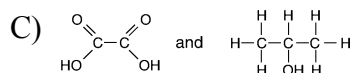
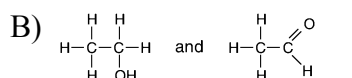
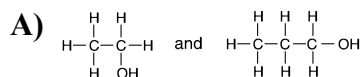
9. Given the structural formula:



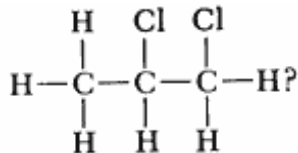
What is the IUPAC name of this compound?

- A) pentanal                      B) pentanol  
C) methyl pentanoate      D) **pentanoic acid**

10. Which pair of compounds are alcohols?

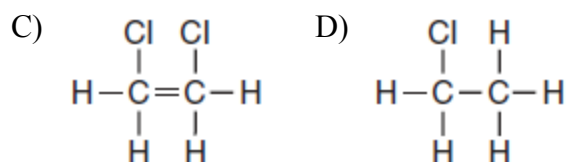
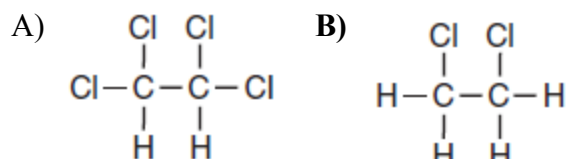


11. What is the correct IUPAC name for

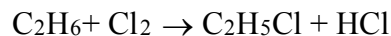


- A) 1,2-dichlorobutane  
B) 2,3-dichlorobutane  
C) **1,2-dichloropropane**  
D) 2,3-dichloropropane

12. Which formula represents the product of the addition reaction between ethene and chlorine, Cl<sub>2</sub>?



13. Given the equation:



This reaction is best described as

- A) addition involving a saturated hydrocarbon  
B) addition involving an unsaturated hydrocarbon  
C) **substitution involving a saturated hydrocarbon**  
D) substitution involving an unsaturated hydrocarbon

14. The reaction  $\text{C}_6\text{H}_{12}\text{O}_6 \rightarrow 2\text{C}_2\text{H}_5\text{OH} + 2\text{CO}_2$  is an example of

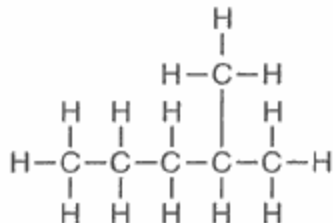
- A) esterification                      B) distillation  
C) **fermentation**                      D) saponification

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## Unit 11 Organic Chemistry

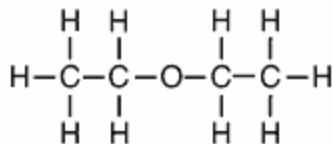
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15. What is the IUPAC name of the organic compound that has the formula shown below?



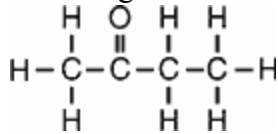
- A) 1,1-dimethylbutane  
**B) 2-methylpentane**  
C) hexane  
D) 4-methylpentane
16. Which compound is a saturated hydrocarbon?
- A)  $\text{CH}_2\text{CH}_2$                       **B)  $\text{CH}_3\text{CH}_3$**   
C)  $\text{CH}_3\text{CHO}$                       D)  $\text{CH}_3\text{CH}_2\text{OH}$

17. Given the structural formula:



The compound represented by this formula can be classified as an

- A) organic acid                      **B) ether**  
C) ester                                  D) aldehyde
18. What is the IUPAC name of the compound with the following structural formula?



- A) propanone                      B) propanal  
**C) butanone**                      D) butanal
19. Hydrocarbons are compounds that contain
- A) carbon, only  
**B) carbon and hydrogen, only**  
C) carbon, hydrogen, and oxygen, only  
D) carbon, hydrogen, oxygen, and nitrogen, only

20. Which formula represents propyne?

- A)  $\text{C}_3\text{H}_4$**                       B)  $\text{C}_3\text{H}_6$   
C)  $\text{C}_5\text{H}_8$                       D)  $\text{C}_5\text{H}_{10}$
-

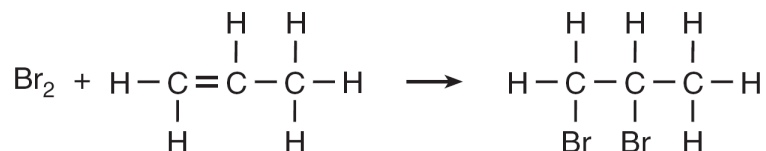
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## Unit 11 Organic Chemistry

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21. Base your answer to the following question on the information below.

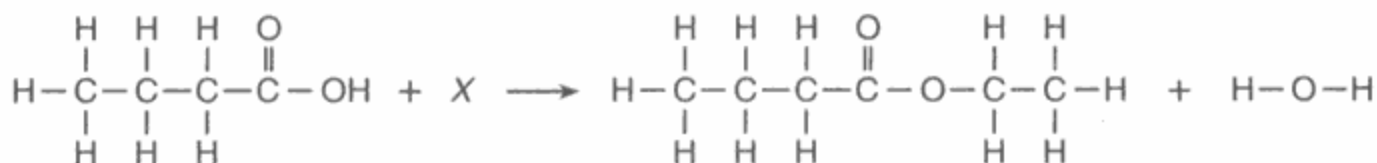
A reaction between bromine and a hydrocarbon is represented by the balanced equation below.



Write the name of the homologous series to which the hydrocarbon belongs.

22. Base your answer to the following question on " the following information.

The equation below represents the reaction between butanoic acid and an unidentified reactant, *X*.



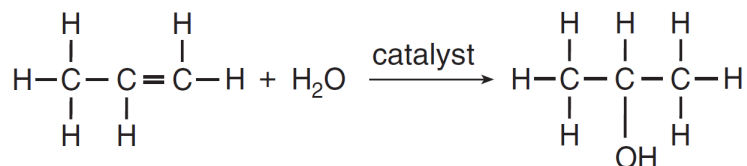
"

Draw a structural formula for the unidentified reactant, *X*, in the equation.

23. Explain, in terms of structural formulas and molecular formulas, why these hydrocarbons are isomers of each other.

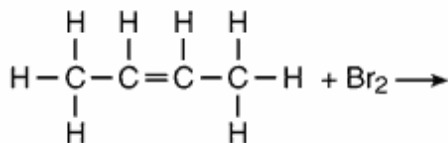
24. Base your answer to the following question on the information below.

In one industrial organic reaction,  $\text{C}_3\text{H}_6$  reacts with water in the presence of a catalyst. This reaction is represented by the balanced equation below.



Explain, in terms of bonding, why  $\text{C}_3\text{H}_6$  is classified as an unsaturated hydrocarbon.

25. In the space to the right of the reactants and arrow provided draw the structural formula for the product of the reaction shown.



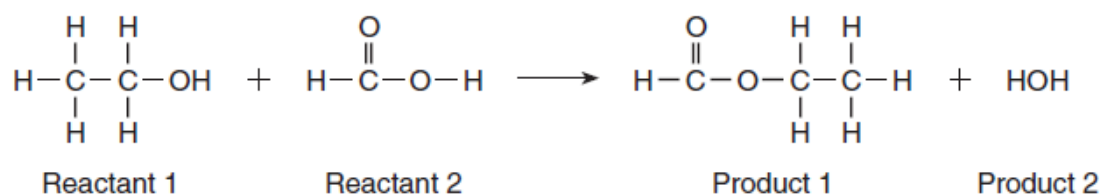
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26. Base your answer to the following question on the information below and on your knowledge of chemistry.

The unique odors and flavors of many fruits are primarily due to small quantities of a certain class of organic compounds. The equation below represents the production of one of these compounds.



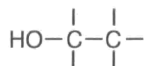
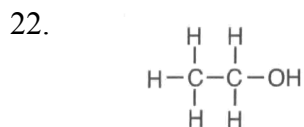
State the class of organic compounds to which product 1 belongs.

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# Answer Key

## Unit 11 Organic Exam

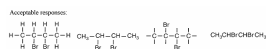
1. A
2. B
3. D
4. A
5. D
6. B
7. D
8. A
9. D
10. A
11. C
12. B
13. C
14. C
15. B
16. B
17. B
18. C
19. B
20. A
21. – alkene *or alkenes*.



23. The molecular formulas of the two hydrocarbons are the same, but the structural formulas are different.

24. Acceptable responses include, but are not limited to: The  $\text{C}_3\text{H}_6$  is unsaturated because each molecule has a double covalent bond between two of its carbon atoms. There is a carbon-carbon double bond in each molecule

25.



26. Ester *or esters*