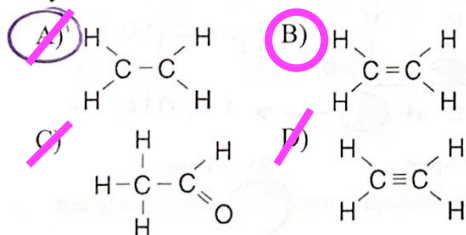


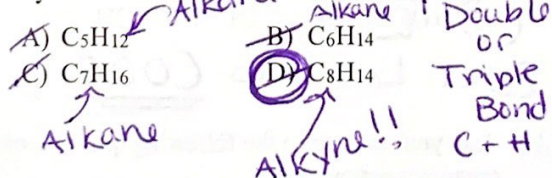
- B 1. Hydrocarbons are compounds that contain
- A) carbon, only
 - B) carbon and hydrogen, only
 - C) carbon, hydrogen, and oxygen, only
 - D) carbon, hydrogen, oxygen, and nitrogen, only

- B 2. Which compound is a saturated hydrocarbon?
- A) CH_2CH_2
 - B) CH_3CH_3
 - C) CH_3CHO
 - D) $\text{CH}_3\text{CH}_2\text{OH}$
- Alkane

- B 3. Which structural formula correctly represents a hydrocarbon molecule?



- D 4. Which formula represents an unsaturated hydrocarbon?



- C 5. What is the total number of electron pairs that are shared between the two carbon atoms in a molecule of ethyne?

- A) 1 B) 2 C) 3 D) 4



3 pairs
6 total electrons

- C 6. Which element is present in all organic compounds?

- A) nitrogen B) oxygen
C) carbon D) sulfur

7. Butanal and butanone have different chemical and physical properties primarily because of differences in their

- A) functional groups \uparrow aldehyde \downarrow ketone
B) molecular masses
C) molecular formulas
D) number of carbon atoms per molecule

- B 8. Organic compounds that are essentially non-polar and exhibit weak intermolecular forces have

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

properties of covalent molecules

- D 9. The two isomers of butane have different

- A) formula masses
B) empirical formulas
C) molecular formulas
D) structural formulas

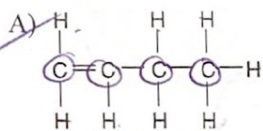
Same molecular formula but diff. structure

- B 10. Which two compounds are isomers of each other?

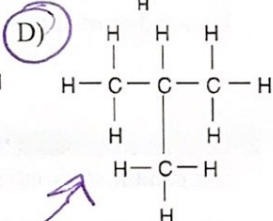
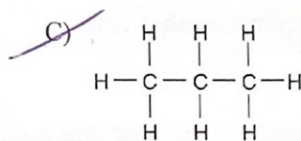
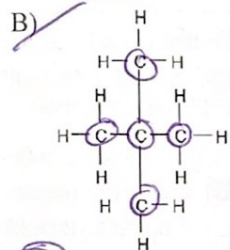
- ~~A) $\text{CH}_3\text{CH}_2\text{COOH}$ and $\text{CH}_3\text{COOCH}_2\text{CH}_3$~~ 3 Cs 4 Cs
B) $\text{CH}_3\text{CH}_2\text{CHO}$ and CH_3COCH_3 $\text{C}_3\text{H}_6\text{O}$
~~C) $\text{CH}_3\text{CBrCH}_3$ and $\text{CH}_2\text{BrCH}_2\text{Br}$~~
~~D) $\text{CH}_3\text{CHOHCH}_3$ and $\text{CH}_3\text{CHOHCH}_2\text{OH}$~~

isomer: Same molecular formula but diff. structure.

D 11. Which formula is an isomer of butane?

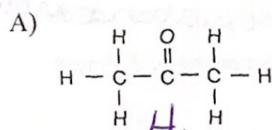


C_4H_8

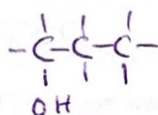


Butane C_4H_{10}

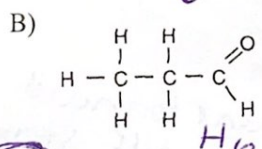
12. Which structural formula represents an isomer of 1-propanol?



H_6

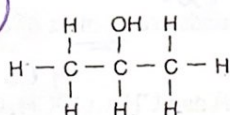


C_3H_7OH

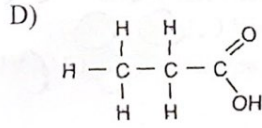


H_6

C)



H_8



H_6

13. Given a formula of a functional group:

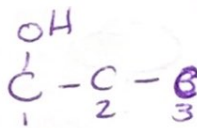


An organic compound that has this functional group is classified as

- A) an acid B) an aldehyde
C) an ester D) a ketone

A 14. If a compound contains only one -OH functional group attached to the end carbon in the chain, it is classified as a

- A) primary alcohol (1st)
B) secondary alcohol
C) tertiary alcohol
D) dihydroxy alcohol

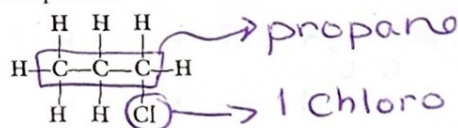


A 15. Methanal is the IUPAC name for an

- A) aldehyde B) alcohol
C) acid D) ether

"AL" means aldehyde!

D 16. What is the correct IUPAC name of the following compound?



propane

1-chloro

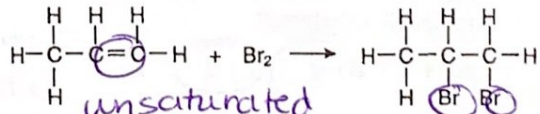
- A) ethane B) propane
C) 3-chloropropane D) 1-chloropropane

C 17. Which compound is an ester?

- A) CH_3COOH B) CH_3CHO
C) $\text{CH}_3\text{COOCH}_3$ D) CH_3COCH_3

Ester likes to COOC!

B 18. Base your answer to the following question on the organic reaction below.



unsaturated

added on!!

This reaction is an example of

- A) fermentation B) addition
C) substitution D) saponification

C 19. Given the equation:



This reaction is best described as

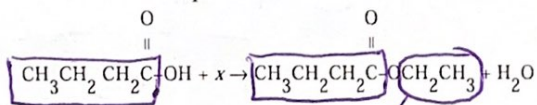
- A) addition involving a saturated hydrocarbon
- B) addition involving an unsaturated hydrocarbon
- C) substitution involving a saturated hydrocarbon
- D) substitution involving an unsaturated hydrocarbon

A 20. Which hydrocarbon will undergo a substitution reaction with chlorine?

- A) methane
- B) ethyne
- C) propene
- D) butene

↓
Saturated Alkane

A 21. Given the incomplete reaction:

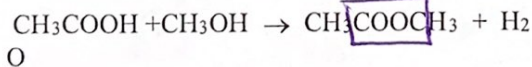


Which compound is represented by x?

- A) CH₃CH₂OH
- B) CH₃C-H
- C) $\begin{array}{c} \text{O} \\ \parallel \\ \text{CH}_3\text{OCH}_2\text{CH}_3 \end{array}$
- D) $\begin{array}{c} \text{O} \\ \parallel \\ \text{CH}_3\text{CCH}_3 \end{array}$

Find the missing piece!

22. In the reaction:



the organic product can best be identified as

- A) an alcohol
- B) a ketone
- C) an ester
- D) an acid

Ester likes to COOC!
(Cook!)

B 23. Which alcohol reacts with C₂H₅COOH to produce the ester C₂H₅COOC₂H₅?

- A) CH₃OH
- B) C₂H₅OH
- C) C₃H₇OH
- D) C₄H₉OH

match it!

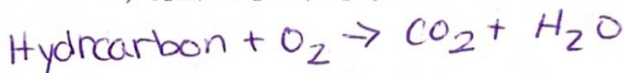
B 24. What are the products of a fermentation reaction?

- A) an alcohol and carbon monoxide
- B) an alcohol and carbon dioxide
- C) a salt and water
- D) a salt and an acid

Alcohol + CO₂ (Bubbles)

C 25. Which reaction best represents the complete combustion of ethene?

- A) C₂H₄ + HCl → C₂H₅Cl
- B) C₂H₄ + Cl₂ → C₂H₄Cl₂
- C) C₂H₄ + 3 O₂ → 2 CO₂ + 2 H₂O
- D) C₂H₄ + H₂O → C₂H₅OH



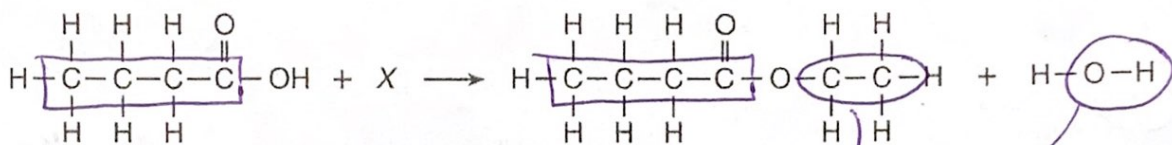
C 26. Which is a product of the hydrolysis of an animal fat by a strong base?

- A) water
- B) gasoline
- C) soap
- D) toluene

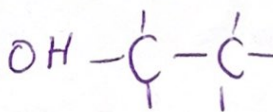
Saponification

27. Base your answer to the following question on the following information.

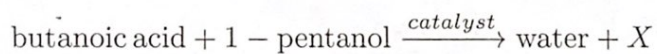
The equation below represents the reaction between butanoic acid and an unidentified reactant, X.



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



28. Given the equation:



To which class of organic compounds does product X belong?

Acid + Alcohol \rightarrow water + Ester!