

Chemistry 11
Organic Chemistry Unit Review

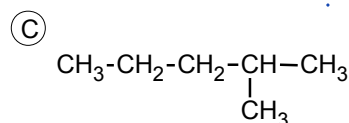
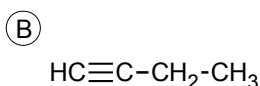
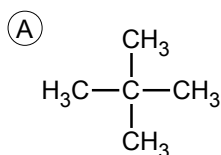
Name:
 Date:
 Block:

Key

Answer the questions in the space provided.

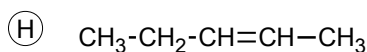
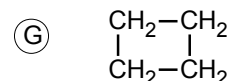
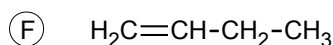
1. Of the following molecules, choose 2 that best fit each description.

- | | |
|---|--|
| a) Structural <u>Isomers</u> - <i>Same formula, diff. arrangement</i> | a) <u>A & E</u> , <u>F & G & D</u> |
| b) Unsaturated Hydrocarbons | b) <u>B, D</u> , <u>F, H</u> |
| c) Have the general formula C_nH_{2n+2} | c) <u>A, C</u> , <u>E</u> |
| d) When water is <u>added</u> , forms an alcohol
<i>↳ unsaturated hydrocarbons</i> | d) <u>B, D</u> , <u>F, H</u> |
| e) Contain <u>alkyl groups</u>
<i>↳ a branch</i> | e) <u>A</u> , <u>C</u> |



(D) 2-butene

(E) pentane



2. Explain what is wrong with each of the following. If a given name is incorrect, provide the correct name.

a) 2-ethylheptane

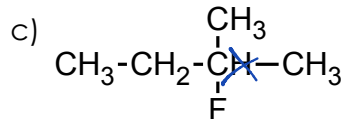


*3-methyloctane
 (longest chain is 8, not 7)*

b) 5-methylhexane (*incorrectly numbered*)



2-methylhexane



extra H on carbon #2

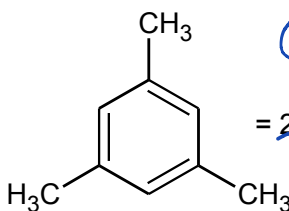
d) 2-fluoro-4-hexyne



(triple bond needs to be lowest #)

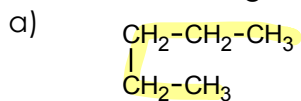
5-fluoro-2-hexyne

e) (*incorrectly numbered*)

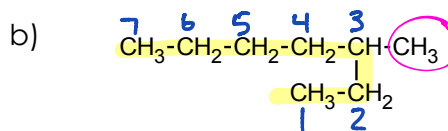


*= 2,4,6-trimethylbenzene
 1,3,5*

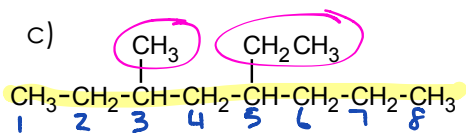
3. Name the following molecules.



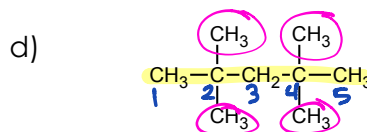
pentane



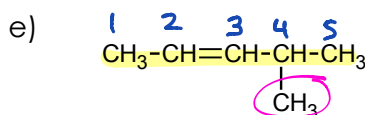
3-methylheptane



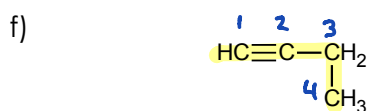
5-ethyl-3-methyloctane



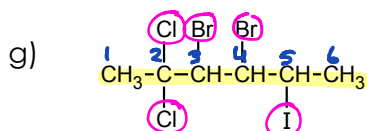
2,2,4,4-tetramethylpentane



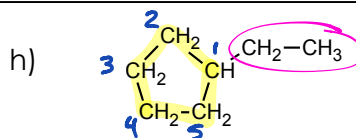
4-methyl-2-pentene



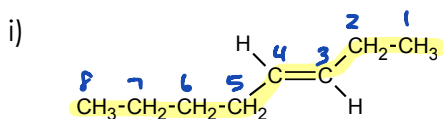
1-butyne or butyne



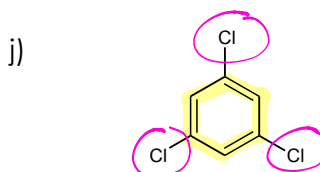
3,4-dibromo-2,2-dichloro-5-iodohexane



1-ethylcyclopentane



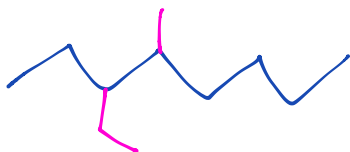
trans-3-octene



1,3,5-trichlorobenzene

4. Draw the structures of the following compounds.

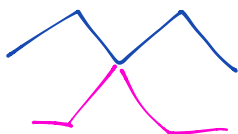
a) 3-ethyl-4-methyloctane



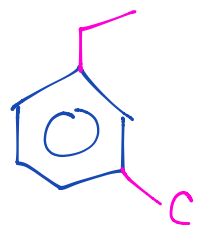
b) 3-heptyne



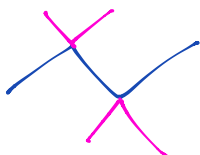
c) 3,3-diethylpentane



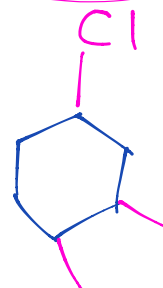
d) 3-chloro-1-ethylbenzene



e) 2,2,3,3-tetramethylbutane



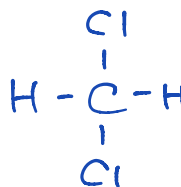
f) 1-chloro-3,4-dimethylcyclohexane



g) 3-iodo-1-propyne



h) dichloromethane



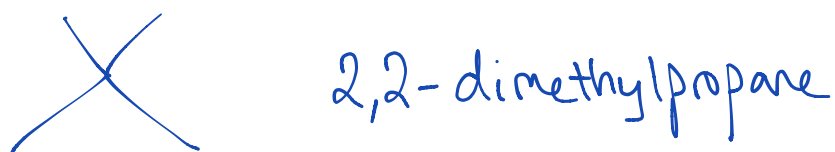
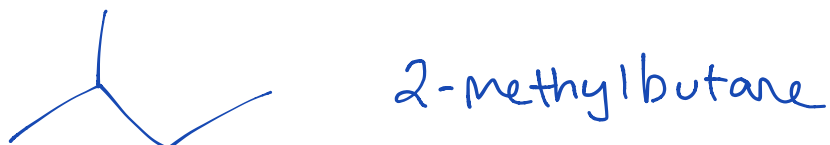
i) 3-heptene



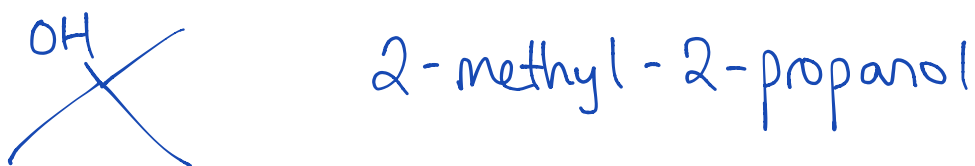
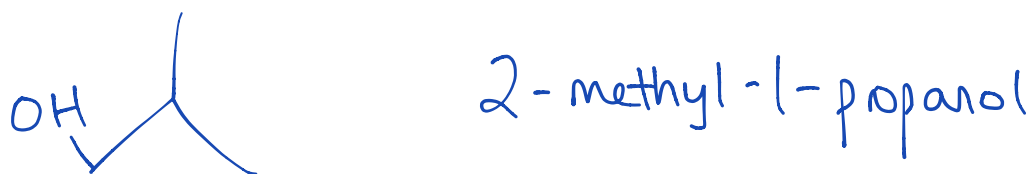
j) cis-2-pentene



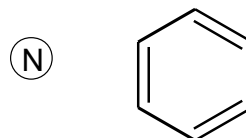
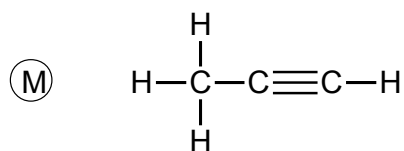
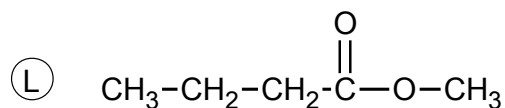
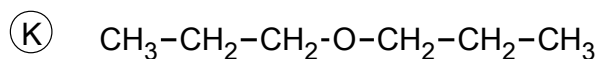
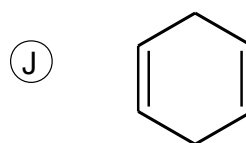
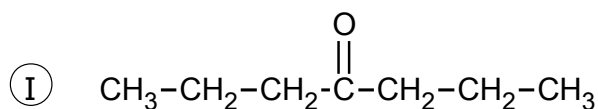
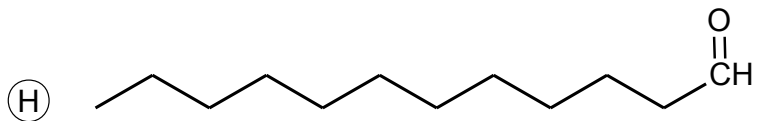
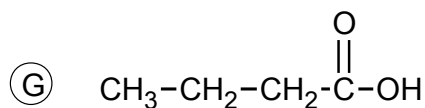
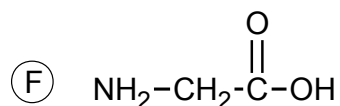
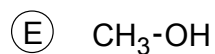
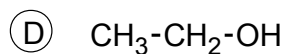
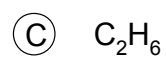
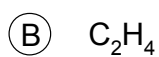
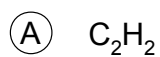
5. Draw and name all of the structural isomers of C_5H_{12} . There are 3!



6. Draw and name as many structural isomers for C_4H_9OH . There are 4!



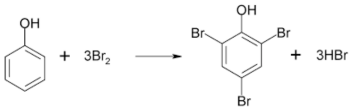
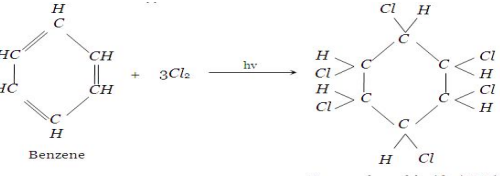
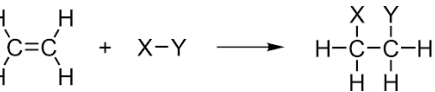
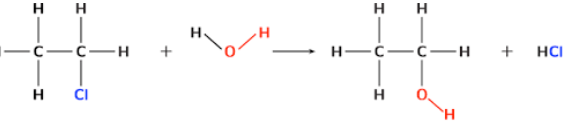

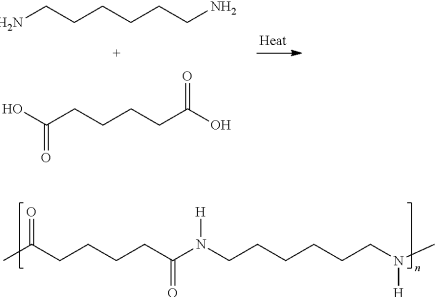
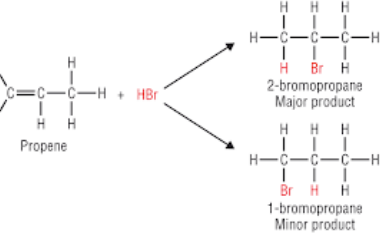

7. Match the following compounds to their appropriate descriptions.



1. D Ethanol
2. G, F A carboxylic acid
3. C A saturated hydrocarbon
4. I A ketone
5. N An aromatic ring
6. M popyne
7. K An ether
8. L An ester

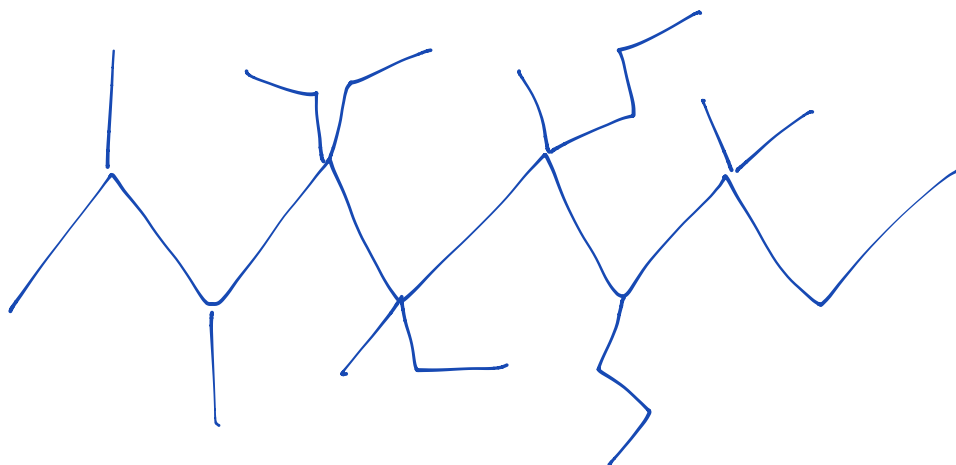
9. H An aldehyde
10. N Benzene
11. C Alkane
12. B Alkene
13. A Alkyne
14. E Methanol
15. N C_6H_6
16. J C_6H_8

8. Classify the following types of reactions as combustion, substitution, addition, elimination or polymerization:

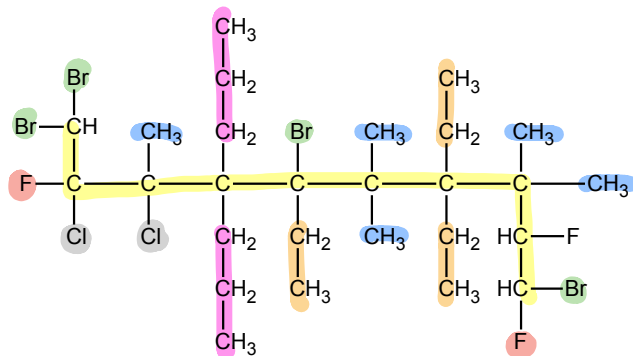
<p>a)</p>  <p>Reaction of phenol with bromine to form 2,4,6-tribromophenol and hydrogen bromide.</p>	<p>Substitution</p>
<p>b)</p>  <p>Reaction of benzene with chlorine under UV light to form hexachlorocyclohexane.</p>	<p>Addition</p>
<p>c)</p>  <p>Reaction of ethene with a diatomic molecule X-Y to form a saturated compound.</p>	<p>Addition</p>
<p>d)</p>  <p>Reaction of chloroethane with water to form ethanol and hydrogen chloride.</p>	<p>Substitution</p>
<p>e)</p>  <p>General substitution reaction of a metal complex with a ligand Y.</p>	<p>Substitution</p>
<p>f)</p>  <p>Reaction of 1,6-hexanediamine and hexanedioic acid under heat to form a polyamide.</p>	<p>Polymerization</p>
<p>g)</p>  <p>Reaction of propene with HBr to form 2-bromopropane (major product) and 1-bromopropane (minor product).</p>	<p>Addition</p>
<p>h)</p>  <p>Reaction of 2-bromopropane with hydroxide ion to form propene and bromide ion.</p>	<p>Elimination</p>

Extra Challenge!

1. Draw this molecule: 4,4,5-triethyl-2,3,5,6,8,8,-hexamethyl-6,7-dipropyldecane



2. Name the following compound:



1,1,5,10-tetrabromo-2,3-dichloro-5,7,7-triethyl-
~~2,9,10-trifluoro-3,6,6,8,8-pentamethyl-4,4-dipropyl~~
 decane

*branches in alpha order!