5.) Give the IUPAC name for the following compounds.

   a.) 2-methyl-3-hexene
   b.) 6-methyl-2,4-heptadiene
   c.) cyclopentene
   d.) 2-pentyne
   e.) 3-isobutyl-5-methylcyclohexene
   f.) 7-propyl-1,3,5-cycloheptatriene
   g.) 2-butyl-3-ethyl-1,4-heptadiene

11.) Each of the following names is wrong. Give the structure and the correct name for each compound.

   a.) 3-pentene
       Numbering can be lower on the double bond: 2-pentene

   b.) 3-methyl-2-butene
       Numbering can be lower on the methyl group: 2-methyl-2-butene

   c.) 2-ethyl-3-pentyne
       Base chain can be longer: 4-methyl-2-hexyne

20.) Draw structural formulas for the following:

   a.) cis-3-hexene

   b.) trans-3-heptene

25.) Complete the following reactions. Where more than one product is possible, show only the one expected according to Markovnikov’s Rule.

   a.) Hydrogenation of 1-butene
b.) Bromination of 1-butene

\[
\text{butane} \quad \text{butane}
\]

1,2-dibromobutane

c.) Hydrochlorination of 1-methylcyclopentene

\[
\text{1-chloro-1-methylcyclopentane}
\]
d.) Acid-catalyzed hydration of 2-methyl-2-butene

\[
2\text{-methyl-2-butanol}
\]

27.) Draw the structural formula for the alkenes with the molecular formula C_5H_{10} to given the following products. Show all correct structures if more than one starting material will react as shown.

a.) Bromination to 2,3-dibromopentane

\[
\text{2-pentene}
\]

c.) Acid-catalyzed hydration of 2-methyl-2-butanol

\[
\text{2-methyl-2-butanol}
\]
2-methyl-2-butene

\[
\text{2-methyl-2-butene} + \text{H}_2\text{SO}_4 + \text{H}_2\text{O} \rightarrow \text{2-methyl-1-butene}
\]

d.) Hydrobromination to 2-bromopentane

1-pentene

\[
\text{1-pentene} + \text{HBr} \rightarrow \text{Br}
\]