1. (3 pts) Draw the structural formula of 3,3-diethyl-4-isobutylcotane.

2. (2 pts) What are the molecular formulas for A and B below?

   A
   \[ \text{CH}_3-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}-\text{CH}-\text{CH}_3 \]
   \[ \text{CH}_2-\text{CH}_2-\text{CH}_3 \]
   \[ \text{CH}_3-\text{CH}_2-\text{CH}_2-\text{CH}-\text{CH}-\text{CH}_3 \]
   \[ \text{CH}_3 \]

   B
   \[ \text{CH}_3 \]
   \[ \text{CH}_3 \]
   \[ \text{CH}_2-\text{CH}_2-\text{CH} \]
   \[ \text{CH}_3 \]
   \[ \text{CH}_3-\text{CH}-\text{CH}-\text{CH}_3 \]
   \[ \text{CH}_3-\text{CH}_2-\text{CH}-\text{CH}_3 \]
   \[ \text{CH}_3 \]

3. (2 pts) How many carbons are there in the longest carbon chain of A? \[ \square \]
Are A or B constitutional isomers of the compound in 1? (Circle correct answer)
Only A is
Only B is
Neither is
Both are

4. (3 pts) Give the IUPAC name of A.

5. (3 pts) Give the IUPAC name of B.
6. (4 pts) Give the IUPAC name of the compound depicted below. Circle a methine carbon in the structure.

\[ \begin{align*}
\text{CH}_3 &- \text{CH} - \text{C} - \text{CH}_2 - \text{CH} - \text{F} \\
\text{CH}_3 &- \text{CH}_2 - \text{C} - \text{F} - \text{Br} \\
\text{Br} &- \text{C} - \text{CH}_3 \\
\text{Br} &- \text{C} - \text{CH}_3
\end{align*} \]

7. (2 pts) Draw the structural formula of n-hexyl iodide.

8. (4 pts) Draw the structures of FOUR different compounds with the molecular formula, C\textsubscript{8}H\textsubscript{18}, which are constitutional isomers and which would be named as trimethylpentanes in the IUPAC naming system.

9. (5 pts) Draw the structures of FIVE different compounds with the molecular formula, C\textsubscript{7}H\textsubscript{16}, which are constitutional isomers and which would be named as pentanes in the IUPAC naming system.

9. (5 pts) Draw the structures of FIVE different compounds with the molecular formula, C\textsubscript{5}H\textsubscript{11}F which are constitutional isomers and which would not be named as pentanes in the IUPAC naming system.

9. (4 pts) Draw the structures of FOUR different compounds with the molecular formula, C\textsubscript{3}H\textsubscript{6}Br\textsubscript{2}, which are constitutional isomers.