Stereochemistry Questions:

1. Draw a Fischer Projection for the following chiral, tetrahedral carbon:

\[
\begin{array}{c}
\text{Br} \\
\text{H} \\
\text{CH}_3 \\
\text{CH}_2\text{CH}_3
\end{array}
\]

2. Assign R or S to the following molecules:

(a)

\[
\begin{array}{c}
\text{Br} \\
\text{Cl} \\
\text{H} \\
\text{CH}_2\text{CH}_3
\end{array}
\]

(b)

\[
\begin{array}{c}
\text{H}_3\text{C} \\
\text{F} \\
\text{CH}_3
\end{array}
\]

3. [10 pts] Identify each of the following pairs of compounds as identical molecules, enantiomers, or diastereomers. Must show work to obtain partial credit.

(a)

\[
\begin{array}{c}
\text{H} \\
\text{H}_3\text{C} \\
\text{NH}_2 \\
\text{H}_2\text{N} \\
\text{H}
\end{array}
\]

(b)

\[
\begin{array}{c}
\text{CH}_3 \\
\text{H} \\
\text{Br} \\
\text{H}_2\text{N} \\
\text{H}
\end{array}
\]

4. Optical Activity:

(a) Calculate the specific rotation for Compound A, whose observed rotation was (+) 35.0 for a solution made from 0.200 g dissolved in 2 mL of chloroform solvent. The cell path length was 10 cm.

(b) Calculate the observed rotation for Compound A, whose specific rotation was (+) 176.0 for a solution made from 0.250 g dissolved in 1 mL of chloroform solvent. The cell path length was 5 cm.

5. Consider the reaction below:

\[
\text{CH}_2=\text{CH}_2 + \text{Br}_2 \rightarrow \text{Br}_2\text{CH}_2\text{CH}_2\text{Br}
\]

How many stereoisomers of the product are possible? Draw them.
Are the products optically active?
6. Consider the reaction below:

\[ \text{H}_2, \text{Pd/C} \]

How many stereoisomers of the product are possible? Draw them. Are the products optically active?

7. Consider the reaction below:

\[ \text{H}_2, \text{Pd/C} \]

How many stereoisomers of the product are possible? Draw them. Are the products optically active?