Work these problems on a blank copy of your Personal Workshop Form.

1. Give a synthesis of the illicit drug methamphetamine (aka crystal meth) starting from benzene and any compounds containing two carbons or less. You are not allowed to start from pseudoephedrine or ephedrine in your backyard.

![Methamphetamine structure]

2. Based on the following information, determine the structures of compounds A – F.

![Chemical reaction diagram]

3. When 1,2-diaminobenzene reacts with 1 equivalent of sodium nitrite at 0 °C, the unstable intermediate X is formed. Heating the mixture converts the intermediate into compound Y.

![Chemical reaction diagram]

a. Determine the structure of intermediate X.

b. Provide a mechanism for the conversion of X to Y, and provide a structure for Y.
4. Give a synthesis of 3-bromo-4-fluorotoluene starting from toluene and any other compound.

\[
\text{CH}_3 \quad \xrightarrow{?} \quad \text{CH}_3 \\
\begin{align*}
\text{F} & \quad \text{Br}
\end{align*}
\]

5. Based on the following information, determine the structures of compounds G – L.

\[
\begin{align*}
\text{N} & \quad \xrightarrow{1. \text{CH}_3\text{I} \quad \text{heat}} \quad \xrightarrow{2. \text{Ag}_2\text{O}, \text{H}_2\text{O}} \\
\text{G} & \quad \text{H} \quad \xrightarrow{1. \text{CH}_3\text{I} \quad \text{heat}} \\
& \quad \xrightarrow{2. \text{Ag}_2\text{O}, \text{H}_2\text{O}} \\
& \quad \xrightarrow{\text{H}_2\text{O}_2} \\
& \quad \xrightarrow{\text{heat}} \\
& \quad \xrightarrow{\text{heat}} \\
& \quad \xrightarrow{\text{heat}} \\
& \quad \xrightarrow{\text{heat}} \\
& \quad \xrightarrow{\text{Ph}_3\text{P} \equiv \text{CH}_2} \\
& \quad \xrightarrow{\text{C}_6\text{H}_8\text{O}_2} \\
\text{L} & \quad \text{K}
\end{align*}
\]