Practice Problem Set #5: Stereochemistry

1. Give names (including R/S where appropriate) for each of the following:

   - [Chemical structures]
   - [Chemical structures]
   - [Chemical structures]
   - [Chemical structures]
   - [Chemical structures]
   - [Chemical structures]
   - [Chemical structures]

2. Indicate the relationship between the following compounds as structural isomers, diastereomers, enantiomers, resonance forms, or identical.

   - (a) [Chemical structures]
   - (b) [Chemical structures]
   - (c) [Chemical structures]
   - (d) [Chemical structures]
   - (e) [Chemical structures]
   - (f) [Chemical structures]
3. Analyze the following reactions, which have all intermediates and products shown, but no stereochemistry and predict whether the product will be R, S or racemic.

(a) 
\[
\text{Br} + \text{CN}^- \rightarrow \text{D} \text{H} \text{CN} \text{ goes with 100\% inversion}
\]

(b) 
\[
\text{Br}^* \rightarrow \text{Br} \rightarrow \text{Br}
\]

(c) 
\[
\text{Br} + \text{CN}^- \rightarrow \text{CN}
\]

(d) 
\[
\text{Br} \rightarrow \text{Br} \rightarrow \text{Br}
\]

(e) 
\[
\text{HBr} \rightarrow \text{Br} \rightarrow \text{Br}
\]

(f) 
\[
\text{Br}_2 \rightarrow \text{Br} \rightarrow \text{Br}
\text{Gives 100\% trans-isomer}
\]