A is inert. Tertiary Halides undergo substitution and elimination by the SN1 or E1 mechanisms. These reactions involve the formation of a carbocation. The carbocation formed from A - shown above is much less stable that that from B because the bridged cation cannot become planar. Non-planar cations are less stable due to reduced stabilization.

2. a. 1-chlorohexane: NuI in acetone indicated SN2 Conditions. SN2 is favored by less steric hindrance. Primary less sterically hindered than secondary.

b. 1-bromopentane: SN2 promoted by weaker, more polarizable bond when steric hindrance is not a factor

3. identical
   enantiomers
   diasteromers
   identical

4. a) SODAR = 0

b) SODAR = 5
4. c) 

\[ \text{SODAR} = 0 \]

\[
\begin{array}{c}
\text{H} \\
\text{H} \\
\text{Cl} \\
\text{Cl} \\
\text{Cl}
\end{array}
\]

4. d) 

\[ \text{SODAR} = 1 \]

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

4. e) 

\[ \text{SODAR} = 1 \]

\[
\begin{array}{c}
\text{Br} \\
\text{doublet} \\
\text{triplet} \\
\text{H} \\
\text{H} \\
\text{H}
\end{array}
\]

5. a) 

\[ \text{SODAR} = 1 \]

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

5 signals in 13C: No Symmetry
4 signals in 1H: confirmed

IR \(\rightarrow\) C=O @ 1700 cm\(^{-1}\)
1H NMR \(\rightarrow\) 4 signals, splitting ok
  Methyl singlet
13C NMR \(\rightarrow\) 5 signals, shifts ok

5. b) 

\[ \text{SODAR} = 2 \]

\[
\begin{array}{c}
\text{H} \\
\text{H} \\
\text{H}
\end{array}
\]

6 carbons but only 3 C13 signals: symmetry

IR \(\rightarrow\) C=c @ 1650 cm\(^{-1}\)
1H NMR \(\rightarrow\) integrals, shifts, ok
(has 4 not 3 kinds of carbons)
13C NMR \(\rightarrow\) 3 kinds of C, shifts ok
5. c) SODAR = 0

5 Carbons but only 3 signals in C13 NMR - symmetry

IR --> O-H @ 3500 cm$^{-1}$
1H NMR --> 4 signals,

13C NMR --> 3 signals, shifts ok

6. \[ \text{O}==\text{C}==\text{O} \quad \text{symmetric} \quad \text{O}==\text{C}==\text{O} \quad \text{antisymmetric} \]

Symmetric stretch does not create a dipole moment whereas the antisymmetric stretch creates a dipole moment.

IR absorption requires creation of and interaction with a dipole -- so the antisymmetric stretch gives the stronger absorption