1. An inductive effect is ____________________.
   a) felt through space
   b) felt through bonds
   c) felt through bonds or space
   d) none of the above

2. Inductive effect ____________________.
   a) is highest for most electronegative atoms
   b) decreases as the number of intervening bonds increase
   c) is typically additive
   d) all of the above

3. The inductive effect on methylenic carbon in $\text{F}_3\text{C}-\text{CH}_2\text{-OH}$ is ____________________.
   a) greater than that on equivalent carbon in $\text{F}_3\text{C}-\text{CH}_3$
   b) lower than that on equivalent carbon in $\text{F}_3\text{C}-\text{CH}_3$
   c) equal to that on equivalent carbon in $\text{F}_3\text{C}-\text{CH}_3$
   d) none of the above

4. The pKa of acetic acid is 4.5, while that of ethanol is 16.5 because
   a) of stronger hydrogen bonding between $\text{H}_2\text{O}$ and $\text{COOH}$ than between $\text{H}_2\text{O}$ and $\text{OH}$.
   b) of weaker hydrogen bonding between $\text{H}_2\text{O}$ and $\text{COOH}$ than between $\text{H}_2\text{O}$ and $\text{OH}$.
   c) of stronger inductive effect of $\equiv\text{O}$ than $-\text{H}$.
   d) of weaker inductive effect of $\equiv\text{O}$ than $-\text{H}$.

5. The order of pKa for the following series of compounds is:
   \[
   \begin{align*}
   \text{CH}_3\text{COOH} & \quad \text{CH}_2\text{FCOOH} & \quad \text{CF}_3\text{COOH} \\
   \text{I} & \quad \text{II} & \quad \text{III}
   \end{align*}
   \]
   a) I > II > III
   b) II > III > I
   c) III > I > II
   d) III > II > I

6. The order of pKa for the following series of compounds is:
   \[
   \begin{align*}
   \text{CH}_3\text{CH}_2\text{CH}_2\text{COOH} & \quad \text{CH}_3\text{CHClCH}_2\text{COOH} & \quad \text{CH}_3\text{CH}_2\text{CHClCOOH} \\
   \text{I} & \quad \text{III} & \quad \text{IV}
   \end{align*}
   \]
7. The order of pKa for the following series of compounds is:

<table>
<thead>
<tr>
<th>Compounds</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH₃COOH</td>
<td>I</td>
</tr>
<tr>
<td>ClCH₂COOH</td>
<td>II</td>
</tr>
<tr>
<td>CHCl₂COOH</td>
<td>III</td>
</tr>
<tr>
<td>CCl₃COOH</td>
<td>IV</td>
</tr>
</tbody>
</table>

a) I > II > III > IV  
b) II > III > IV > I  
c) III > IV > I > II  
d) IV > III > II > I

8. The order of pKa for the following series of compounds is:

<table>
<thead>
<tr>
<th>Compounds</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH₃CH₂CH₂NH₂</td>
<td>I</td>
</tr>
<tr>
<td>Cl-CH₂CH₂CH₂NH₂</td>
<td>II</td>
</tr>
<tr>
<td>CH₃CHClCH₂NH₂</td>
<td>III</td>
</tr>
<tr>
<td>CH₃CH₂CHClNH₂</td>
<td>IV</td>
</tr>
</tbody>
</table>

a) I > II > III > IV  
b) II > III > IV > I  
c) III > IV > I > II  
d) IV > III > II > I

9. Aniline is less basic than cyclohexylamine due to
   a) resonance
   b) inductance
   c) none of the above
   d) all of the above

10. The order of group electronegativities is _____________
    a) –NO₂ > -COOH > -CHO ~ -CN
    b) –NO₂ > -CN ~ -CHO > -COOH
    c) –all of the above
    d) –none of the above