Table 1. Dissociation Constants for some Acids.

<table>
<thead>
<tr>
<th>Acid</th>
<th>pKₐ Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>NH₄⁺</td>
<td>10</td>
</tr>
<tr>
<td>HClO</td>
<td>8</td>
</tr>
<tr>
<td>HBF₄</td>
<td>-9</td>
</tr>
<tr>
<td>H₂CO₃</td>
<td>7</td>
</tr>
<tr>
<td>formic</td>
<td>4</td>
</tr>
<tr>
<td>benzoic</td>
<td>5</td>
</tr>
</tbody>
</table>

1. (5 pts) Which of the acids listed in Table 1, given a 0.01 M solution in water, will have a pH closest to 2?
   a) NH₄⁺    b) benzoic    c) H₂CO₃    d) formic    e) HBF₄

2. (5 pts) Which of the acids listed in Table 1, when reacted with an equivalent amount of NaOH, will form a solution with the highest pH?
   a) NH₄⁺    b) benzoic    c) H₂CO₃    d) formic    e) HBF₄

3. (5 pts) Order the acids in Table 1 from strongest to weakest. Circle the correct choice.
   a) benzoic > formic > H₂CO₃ > HBF₄ > NH₄⁺ > HClO
   b) HBF₄ > formic > benzoic > H₂CO₃ > HClO > NH₄⁺
   c) NH₄⁺ > benzoic > HBF₄ > formic > H₂CO₃ > HClO
   d) benzoic > HBF₄ > NH₄⁺ > formic > H₂CO₃ > HClO
   e) NH₄⁺ > HClO > H₂CO₃ > benzoic > formic > HBF₄

4. (5 pts) What is the pH of a 0.01 M solution of the weak base benzylamine (C₆H₅CH₂NH₂)? pKₐ = 8. Circle the answer below and clearly show all your work.
   a) 4     b) 5     c) 9     d) 10     e) 13

5. (10 pts) Will FeCl₃ generate an acidic, neutral, or basic solution when dissolved in water. Clearly discuss your reasoning.
6. (5 pts) What is the pH of a 1 M solution of KClO? See Table 1 for $pK_a$ values. Clearly show all your work.

7. (10 pts) Consider the following list of salts:
A) NH₄Cl   B) KI   C) CsF   D) potassium benzoate
E) MoCl₄   F) BaI₂   G) AlBr₃   H) LiNO₃
I) KClO₄   J) NaClO

Which salts will generate an **acidic** solution? ________________
Which salts will generate a **basic** solution? ________________
Which salts will generate a **neutral** solution? ________________

8. (5 pts) Calculate the $pK_b$ of the weak base phenylamine if a 1 M solution has a pH = 10.

9. (10 pts) What is the pH if 800 mL of 0.125 M KOH is added to 200 mL of 0.5 M succinic acid (a monoprotic acid)? $pK_a = 11$ (clearly show all your work)