1. Hydriodic acid is dissolved in water. Write an equation for this process. Give the $K_{eq}$ and $K_a$ expressions corresponding to the equilibrium. Does the equilibrium lie to the right or to the left? (7 points)

2. Acid A has a $pK_a$ value of 4.8 and Acid B has a $pK_a$ value of 8.2. Which acid’s conjugate base is the strongest base? (2 points)

3. Rank the following acids from strongest to weakest (1 = Strongest, 4 = weakest). (4 points)

4. Explain using acid strength factors the $pK_a$ difference between the two acids below. (2 points)
5. Classify the following compounds as polar (P) or nonpolar (NP). Circle any that are capable of forming hydrogen bonds. (4 points)

BCl₃   CH₃CH₂OH   CCl₂Br₂

6. Clearly label 5 functional groups present in the following compound. (3 points)

![Functional Groups](image)

7. Provide a “curved arrow” mechanism for the following reaction: (3 points)

HCl + CH₃CH₂OH → [CH₃CH₂OH₂]⁺ + Cl⁻