

1. As drawn, which functional group has the lowest pKa?
- A Carboxylic acid
 - B Ammonium group
 - C Carboxylate
2. The structure of ATP is shown. What functional group is enclosed by the dotted line marked A?
- A A conjugate base related to phosphoric acid
 - B A phosphate / phosphoric anhydride
 - C An amide of phosphoric acid (= phosphoramidate)
 - D A phosphate / phosphoric ester
 - E An acidic proton on a phosphoric acid derivative
3. The structure of ATP is shown. What functional group is enclosed by the dotted line marked B?
- A A conjugate base related to phosphoric acid
 - B A phosphate / phosphoric anhydride
 - C An amide of phosphoric acid (= phosphoramidate)
 - D A phosphate / phosphoric ester
 - E An acidic proton on a phosphoric acid derivative
4. The structure of ATP is shown. Which option below best describes the negatively charged oxygens?
- A A conjugate base related to phosphoric acid
 - B A phosphate / phosphoric anhydride
 - C An amide of phosphoric acid (= phosphoramidate)
 - D A phosphate / phosphoric ester
 - E An acidic proton on a phosphoric acid derivative
5. Which of the following structures is NOT a resonance form of phenol?
- A A
 - B B
 - C C
 - D D

6. If the reaction profile shown represents some acid dissociation process, which of the following statements are true? Mark all that apply.

- A The species is a strong acid
- B $K_a \gg 1$ (\gg means much greater than)
- C The reaction is endergonic
- D The pKa is positive
- E The reaction is favorable / spontaneous