請注意：考題中若涉及計算，請將演算過程列出，否則不予計分。

1. What is the relation between the standard deviation and the precision of a procedure？(3%)
   What is the relation between standard deviation and accuracy？ (3%)

2. K_a for acetic acid is 2×10^{-5}. Find K_b for acetate ion. (10%)

3. What is the difference between a direct titration and a back titration？ (10%)

4. Calculate the pH of (a) 0.2M HCl, (3%)   (b) 0.2M acetic acid ($K_a = 2 \times 10^{-5}$). (3%)

5. The acid HA has $pK_a = 7.00$.
   (a) Which is the principal species, HA or A⁻, at pH6.00？Explain your answer. (5%)
   (b) Which is the principal species at pH8.00？Explain your answer. (5%)
   (c) What is the quotient 〔A⁻〕/〔HA〕at pH7.00？(5%)

6. Define each of the following：
   (a) half-reaction, (3%)
   (b) oxidation-reduction couple, (3%)
   (c) standard electrode potential, (3%)
   (d) indicator electrode, (3%)
   (e) reference electrode. (3%)

7. In iodometry, the starch indicator is not added until just before the end point. Why？ (10%)

8. What is the difference between a galvanic cell and an electrolysis cell？ (10%)

9. The absorbance of a 2.31×10^{-5}M solution of a compound is 0.822 at a wavelength of 266nm in a 10-cm cell. Calculate the molar absorptivity at 266nm. (10%)

10. Why do some absorbing compounds fluoresce and others not？ (4%)
    What structural features appear to favor fluorescence？ (4%)