2002 HIGHER SCHOOL CERTIFICATE EXAMINATION

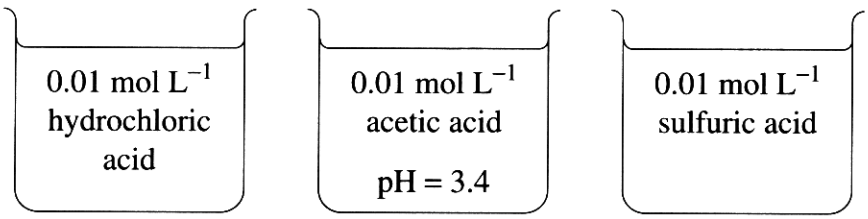
Chemistry

Section I – Part B (continued)

Marks

Question 22 (5 marks)

Solutions of hydrochloric acid, acetic acid and sulfuric acid were prepared. Each of the solutions had the same concentration (0.01 mol L^{-1}). The pH of the acetic acid solution was 3.4.



(a) Calculate the pH of the hydrochloric acid solution. **1**

pH = -log [H⁺] pH = 2

(b) Compare the pH of the sulfuric acid solution to the pH of the hydrochloric acid solution. Justify your answer. (No calculations are necessary.) **2**

The hydrochloric acid has a lower pH than the acetic acid because it is a stronger acid

(c) Explain why the acetic acid solution has a higher pH than the hydrochloric acid solution. **2**

Hydrochloric acid is a very strong acid so should have low pH, and acetic is not as strong with the same concentration, the acetic acid should have a higher pH.