

**Marks**  
**4**

- Buffer 1 is a solution containing 0.08 M  $\text{NH}_4\text{Cl}$  and 0.12 M  $\text{NH}_3$ . Buffer 2 is a solution containing 0.15 M  $\text{NH}_4\text{Cl}$  and 0.05 M  $\text{NH}_3$ . The acid dissociation constant of the ammonium ion is  $5.50 \times 10^{-10}$ . What are the pH values of each of the buffer solutions?

Buffer 1 pH =

Buffer 2 pH =

Which buffer is better able to maintain a steady pH on the addition of small amounts of both a strong acid and strong base? Explain.