Question 32 **(9 marks)**

A buffer solution containing 0.1 mol L^{-1} ammonia and 0.1 mol L^{-1} ammonium chloride is used in a laboratory-scale experiment involving a biological process.

(a) Write the equation for the equilibrium reaction in the buffer solution involving the weak acid and its conjugate base. (2 marks)

(b) Label the weak acid and its conjugate base in the above equation. (1 mark)

(c) The biological process in the experiment produces a small amount of strong acid. Predict and explain the impact on the pH of the buffer solution. (3 marks)

(d) Define the term 'buffer capacity'. (1 mark)

(e) Identify **two** factors that determine buffer capacity of a system. (2 marks)

One:

Two: