

Name of the Student: _____

Max. Marks : 15 Marks

Time : 15 Minutes

Q1.

Hydrochloric acid is a strong acid and ethanoic acid is a weak acid.

- (a) State the meaning of the term strong acid.

(1)

- (b) In an experiment, 10.35 cm^3 of $0.100 \text{ mol dm}^{-3}$ hydrochloric acid are added to 25.0 cm^3 of $0.150 \text{ mol dm}^{-3}$ barium hydroxide solution.

Calculate the pH of the solution that forms at 30°C

$$K_w = 1.47 \times 10^{-14} \text{ mol}^2 \text{ dm}^{-6} \text{ at } 30^\circ\text{C}$$

Give your answer to 2 decimal places.

pH _____

(6)

- (c) The pH of water at 30°C is 6.92

Give the reason why water is neutral at this temperature.

(1)

- (d) Identify the oxide that could react with water to form a solution with $\text{pH} = 2$

Tick (✓) **one** box.



(1)

- (e) Give the expression for the acid dissociation constant (K_a) for ethanoic acid (CH_3COOH).



(1)

- (f) A buffer solution contains 0.025 mol of sodium ethanoate dissolved in 500 cm^3 of 0.0700 mol dm^{-3} ethanoic acid at 25 °C

A sample of 5.00 cm^3 of 2.00 mol dm^{-3} hydrochloric acid is added to this buffer solution.

Calculate the pH of the solution formed.

For ethanoic acid, $K_a = 1.76 \times 10^{-5} \text{ mol dm}^{-3}$ at 25 °C

pH _____

(5)

(Total 15 marks)