Practice Question Set For A-Level
Subject : Chemistry
Paper-1 Topic: Physical 1_Acids And Bases

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Name of the Student:_____
Max. Marks : 20 Marks **Time : 20 Minutes**

Q1.

Nitric acid (HNO_{-3}) is a strong acid. Ethanoic acid (CH_3COOH) is a weak acid.

(a) Write an equation to show how ethanoic acid behaves as a weak acid in its reaction with water.

_____

(1)

(b) When pure ethanoic acid reacts with pure nitric acid, ethanoic acid acts as a base.

Write an equation for this reaction.

_____

(1)

(c) Two beakers, **A** and **B**, each contain 100.0 cm^{-3} of 0.0125 mol dm^{-3} nitric acid.

(i) Calculate the pH of the solution formed after 50.0 cm^{-3} of distilled water are added to beaker **A**.
Give your answer to 2 decimal places.

_____

_____

_____

(2)

(ii) Calculate the pH of the solution formed after 50.0 cm^3 of 0.0108 mol dm^{-3} aqueous sodium hydroxide are added to beaker **B**.
Give your answer to 2 decimal places.

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(4)

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(d) A third beaker, **C**, contains 100.0 cm^3 of 0.0125 mol dm^{-3} ethanoic acid.
The acid dissociation constant K_a for ethanoic acid has the value 1.74×10^{-5} mol dm^{-3} at 25 °C.

(i) Write an expression for K_a for ethanoic acid and use it to calculate the pH of the ethanoic acid solution in beaker **C**.
Show your working. Give your answer to 2 decimal places.

K_a _____

_____

Calculation _____

_____

_____

_____

(4)

(ii) Aqueous sodium hydroxide is added to beaker **C** until the pH of the solution becomes 4.84.

Name the salt formed in the reaction of ethanoic acid with sodium hydroxide.

_____

(1)

(iii) Calculate the value of $\frac{[\text{salt}]}{[\text{ethanoic acid}]}$ in the solution with the pH of 4.84.

_____

_____

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_____

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_____

(3)

(e) Explain why chloroethanoic acid is a stronger acid than ethanoic acid.

_____

_____

_____

_____

(2)

(f) Explain why data books do not usually contain values of K_a for strong acids.

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(2)

(Total 20 marks)

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