JOINT UNIVERSITIES PRELIMINARY EXAMINATIONS BOARD

JUNE 2020 EXAMINATIONS

JUPEB/005P

CHEMISTRY PRACTICAL **SCI – J153** **Time Allowed: 2½ Hours**

Answer ALL Questions.

QUESTION 1: QUANTITATIVE ANALYSIS

1. You are provided with the following:

   Solution **Y**: A 0.10 moldm^{-3} of HNO_3.

   Solution **Z**: A 1.86 g of $Na_2CO_3.nH_2O$ in 250cm^{3}of solution.

   Methyl Orange indicator.

   (a) **Procedure:**

   i. Pipette 25cm^3 of solution **Z** into the conical flask. Add 2 or 3 drops of indicator. Titrate against solution **Y** in the burette. Record your titre values.

   ii. Repeat the titration 2 more times and find the average titre value.

   iii. Write the balanced equation of reaction

   [Na = 23; O = 16; C = 12; N = 14; H = 1]

   (b) From your result, calculate:

   i. Number of moles of solution **Y** and **Z** used

   ii. Concentration in mol/dm^3 of anhydrous Na_2CO_3 in **Z**

   iii. Concentration in g/dm^3 of anhydrous Na_2CO_3 in **Z**

   vi. The numerical value of n in the formula

[Total =10 marks]

QUESTION 2: QUALITATIVE ANALYSIS

2. You are provided with three liquid organic samples **(A), (B)** and **(C)**, and you are required to perform the following tests to identify the functional groups present in samples **(A), (B)** and **(C).**

TEST 1: Add 1 cm^3 of sample **(A), (B)** and **(C)** to separate test tubes and add 1 cm^3 of 2, 4-Dinitrophenylhydrazine

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TEST 2: To fresh 1 cm^3 of samples of **(A), (B)** and **(C)** in separate test tubes, Add 1 cm^3 Tollen's reagent.

TEST 3: To fresh 1 cm^3 of samples of **(A), (B)** and **(C)** in separate test tubes, add 1 cm^3 of potassium dichromate solution followed by 1 cm^3 of $NaHCO_3$.

TEST 4: To fresh 1 cm^3 of samples of **(A), (B)** and **(C)** in separate test tubes. Add 1 cm^3 of Iodine solution followed by 1 cm^3 of NaOH.

Record your observation and inference at each step.

State the functional groups present in **(A), (B)** and **(C).**

Write the structure formulae of sample **(A)**, **(B)** and **(C)** if they contain 3 carbon atoms each.

[Total = 10 marks]