



**JOINT UNIVERSITIES PRELIMINARY EXAMINATIONS BOARD**

**JUNE 2020 EXAMINATIONS**

**JUPEB/005P**

**CHEMISTRY PRACTICAL**

**SCI – J153**

**Time Allowed: 2½ Hours**

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**Answer ALL Questions.**

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**Turn Over**

### QUESTION 1: QUANTITATIVE ANALYSIS

1. You are provided with the following:

Solution Y: A  $0.10 \text{ mol dm}^{-3}$  of  $\text{HNO}_3$ .

Solution Z: A 1.86 g of  $\text{Na}_2\text{CO}_3 \cdot n\text{H}_2\text{O}$  in  $250 \text{ cm}^3$  of solution.

Methyl Orange indicator.

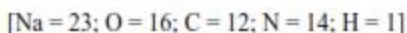
(a) **Procedure:**

i. Pipette  $25 \text{ cm}^3$  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



(b) From your result, calculate:

i. Number of moles of solution Y and Z used

ii. Concentration in  $\text{mol/dm}^3$  of anhydrous  $\text{Na}_2\text{CO}_3$  in Z

iii. Concentration in  $\text{g/dm}^3$  of anhydrous  $\text{Na}_2\text{CO}_3$  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  $1 \text{ cm}^3$  of sample (A), (B) and (C) to separate test tubes and add  $1 \text{ cm}^3$  of 2, 4-Dinitrophenylhydrazine

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

TEST 3: To fresh  $1 \text{ cm}^3$  of samples of (A), (B) and (C) in separate test tubes, add  $1 \text{ cm}^3$  of potassium dichromate solution followed by  $1 \text{ cm}^3$  of  $\text{NaHCO}_3$ .

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

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]**