Name……..class……

P525/ 3
Chemistry
(Practical)
Paper 3
Feb /Mar, 2022
3 ¼ hours.

S.5 EXAMINATIONS – 2022
CHEMISTRY PRACTICAL
PAPER 3
TIME: 3 ¼ HOURS

INSTRUCTIONS TO CANDIDATES

*Answer **all** questions*

Record your answers in this question paper in the spaces provided.

You are not allowed to use any reference book

Mathematical tables, slide rulers and silent non-programmable electronic calculators may be used.

Candidates are not allowed to start working with the apparatus for the first 15 minutes. This time is to ensure that they have all the chemicals and apparatus they need.

For Examiner's Use Only			
Q1	*Q2*	*Q3*	*TOTAL*

Question one

You are provided with the following reagents;
T which is oxalic acid crystals,
FA_2 which is sodium hydroxide solution of unknown concentration.
Phenolphthalein indicator
You are required to;
Standardize using oxalic acid.

Procedure

Weigh accurately about 1.6 of T in a clean beaker. Add 100 of distilled water and stir to dissolve T thoroughly. Then transfer this solution into a 250ml volumetric flask and make up the solution to the mark. Label this solution

Pipette exactly (or 20) of FA_1 into a clean conical flask and add 2-3 drops of phenolphthalein indicator. Titrate it with FA_2 from the burette until the solution just turns pink. Repeat the titration to obtain consistent values.

Record your results in the table below.

Mass of weighed beaker+T…….
Mass of weighed beaker alone……..
Mass of T alone……
Volume of pipette used……

Experimental trial	1	2	3
Final burette reading/			
Initial burette reading/			
Volume of FA_2/			

(a)
(i) Values used to calculate average titre value ……, ……
(ii) Calculate the average titre value of FA_2
……
……
……
(iii) Write an equation for the reaction that took place
……
……
……
(b) Determine the molarity of FA_1
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……
……
(c) Calculate the concentration ofFA_2 in mol
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……
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……
……
……
(d) Calculate the concentration of FA_2 in. (Na=23, H=1)
……
……
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……
……
……

Question two

You are provided with substance P which contains two cations and two anions.
You are required to carry out the following tests and identify the cations and anions in P, identify any gases that may be evolved.

(29marks)

TESTS	OBSERVATIONS	DEDUCTIONS
(a) Heat a spatula endful of P in a dry test tube strongly until in excess.		
(b)To a spatula endful of P in a boiling tube add dilute nitric acid until the solid just dissolves. Then add sodium hydroxide dropwise until in excess. Filter. Wash the residue and keep it for test(d). Keep the filtrate for test (c).		
(c) To the filtrate add dilute nitric acid until the solution is just acidic. Divide the acidic solution into five portions.		
(i) To the first portion add sodium hydroxide solution drop wise until in excess.		

(ii) To the second portion of the acidic solution add ammonia solution dropwise until in excess.		
(iii) Carry out a test of your choice to confirm the cation in the filtrate …… …… …….. ……..		
(iv) To the fourth portion add lead (II) nitrate solution		
(v) Carry out a test of your choice to confirm the anion in the filtrate. …… …… ……		
(d) To the residue in a test tube add dilute hydrochloric acid. Until it just dissolves. Divide the solution into four portions.		
(i) To the first portion add sodium hydroxide solution until in excess.		
(ii) To the second portion add ammonia solution until in excess.		
(iv) Carry out a test of your choice to confirm the cation in the residue. …….. …….. ……		

The cations in P are…….. and ……..
The anions in P are …… and ……..

Question three

You are provided with an organic substance **E**. You are required to identify the nature of **E**. Carry out the following tests on **E** and record your observations and deductions in the table below.

TESTS	OBSERVATIONS	CONCLUSIONS
(a) Burn a small amount of E on a spatula end.		
(b) To about 1 of distilled water a test tube, add 1 of E. Test the resultant solution with litmus paper		
(c) To about 1 of sodium hydroxide solution add 1 of E. shake.		
(d) To about 1 of sodium carbonate solution add 1 of E.		
(e) Put 1 of E in a test tube and add 1 of ethanol followed by 2-3 drops of concentrated sulphuric acid and warm gently. Then pour the contents into a beaker of cold water.		

(f) Comment on the nature of E.

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THE END