

Name.....

Index No.

School

Date.....

Sign.....

233/3

CHEMISTRY

PAPER 3

PRACTICAL

JULY / AUGUST 2020

Time: 2 ½ Hours

NANDI CENTRAL DISTRICT JOINT EVALUATION TEST - 2020
Kenya Certificate of Secondary Education (K.C.S.E)

CHEMISTRY

PAPER 3

PRACTICAL

Time: 2 ½ Hours

INSTRUCTIONS TO CANDIDATES

- Write your name and index number in the spaces provided.
- Sign and write the date of examination in the spaces provided.
- Answer ALL the questions in the spaces provided in the question paper
- You are NOT allowed to start working with the apparatus for the first 15 minutes of the 2 ¼ hours allowed for this paper. This time is to enable you to read the question paper and make sure you have all the chemicals and apparatus required.
- ALL working MUST be clearly shown where necessary
- Mathematical tables and electronic calculators may be used.

FOR EXAMINERS USE ONLY

QUESTION	Max Score	Candidate Score
1	22	
2	11	
3	07	
TOTAL	40	

*This paper consists of 12 printed pages.
Candidates should check the question paper to ensure that all pages are printed as indicated
and no questions are missing*

1. You are provided with;
- Solution A dilute hydrochloric acid.
 - Solution B, prepared by dissolving 1g of sodium hydroxide in 100cm³ of water and made to 250cm³ of solution.
 - 8cm long piece of solid C.
 - 15cm or 30cm ruler
 - Phenolphthalein indicator
 - Means of labeling

You are required to standardize solution A.

Procedure I

- i) Measure exactly 10cm³ of solution A using the burette and transfer into a clean 250ml volumetric flask. Top up using distilled water up to the mark labeled as solution D.
NB: Preserve the remaining solution A for use in procedure (ii) and Question 2.
- ii) Drain out the remaining solution A in the burette, rinse the burette thoroughly and put solution D up to the mark
- iii) Using a pipette filler, pipette 25cm³ of B into a conical flask. Add two drops of phenolphthalein indicator.
- iv) Titrate solution D with solution B and record your results in the table I below. Repeat procedures (i) to (iv) to complete table I below

	I	II	III
Final burette reading (cm ³)			
Initial burette reading (cm ³)			
Volume of D used (cm ³)			

- (4mks)
- a) Calculate the average volume of solution D used (1mk)
 - b) Calculate
 - i) The number of moles of solution B reacting (1 ½ mks)
 - ii) The number of moles of solution D in 250cm³ of solution (1 ½ mks)

iii) The molarity of solution A

(1mk)

Procedure II

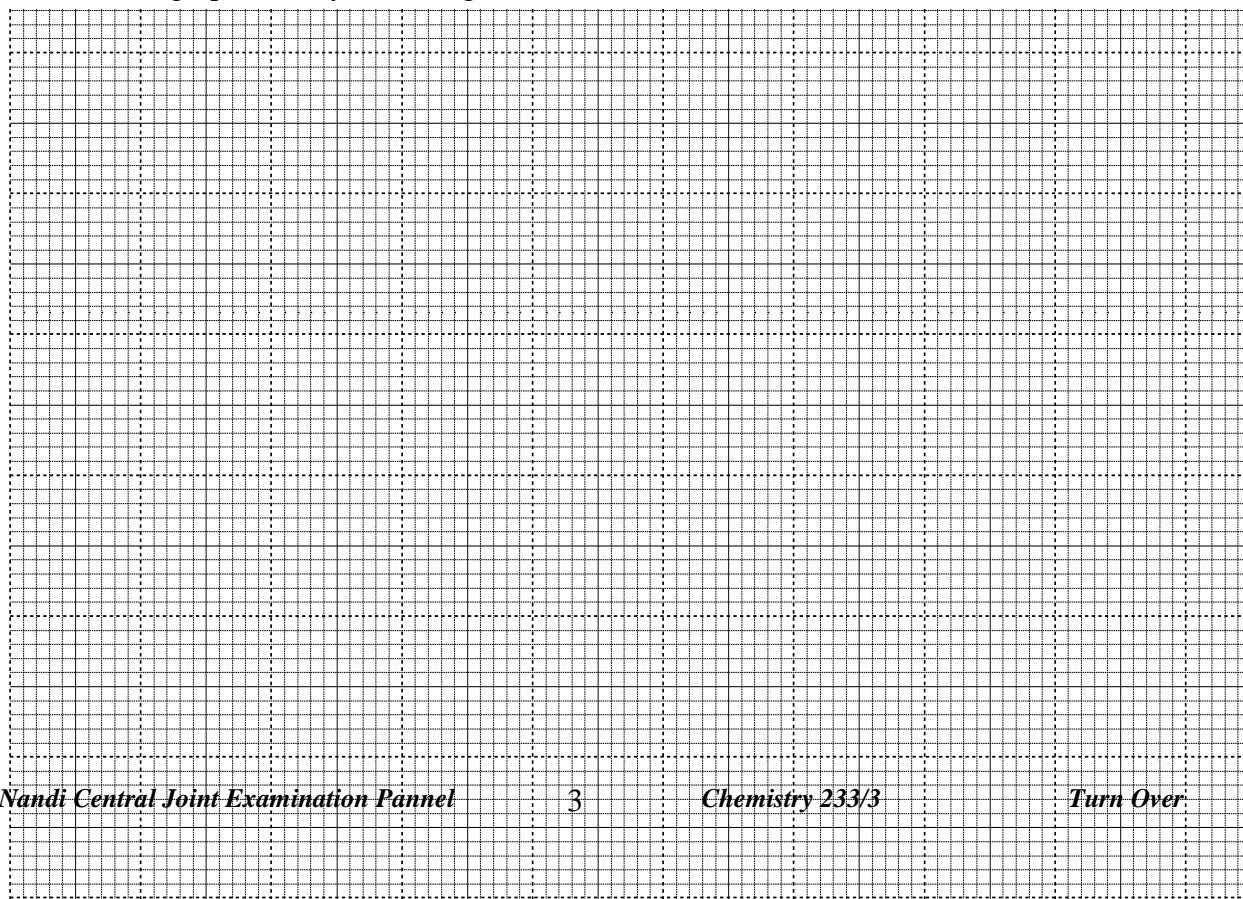
- i) Cut solid C, magnesium ribbon into equal pieces each 2cm long.
- ii) Measure using a well rinsed burette, 12cm³ of solution A into a clean boiling tube.
- iii) Drop one piece of 2cm long magnesium ribbon into the boiling tube containing solution A and start the stop clock immediately. Stop the stop clock when all magnesium has just been consumed. Record the results in the table II below.
- iv) Repeat procedure (ii) and (iii) using 10cm³, 8cm³, 6cm³ and 4cm³ of solution A. Top each using distilled water to make 12cm³ of solution and complete the table II below.

Volume of solution A (cm ³)	Volume of distilled water added (cm ³)	Concentration of solution A in mol/l	Time seconds	$\frac{1}{t}$
12	0			
10	2			
8	4			
6	6			
4	8			

(7mks)

- a) Plot a graph of $\frac{1}{t}$ (y – axis) against concentration of solution

(3mks)



- b) From the graph
- i) Determine the time taken for the reaction to reach completion when 2.5 moles of solution A are used (2mks)
- ii) Comment on the shape of the graph (1mk)

2. You are provided with solid Q. Carry out the following tests and write your observations and inferences in the spaces provided.

- a) Place about one-half of solid Q in a clean dry test-tube. Heat it strongly and test any gas produced using the litmus papers provided.

Observations	Inferences
(1mk)	(1mk)

- b) Place the rest of solid Q into a clean boiling tube and add about 10cm³ of distilled water. Shake thoroughly.

- i) To about 2cm³ of the solution, add sodium hydroxide dropwise until in excess.

Observations	Inferences

(1mk)	(2mks)
-------	--------

ii) To the next 2cm³ of the solution, add hydrochloric acid, solution A

Observations	Inferences
(1mk)	(1mk)

iii) Dip a clean glass rod into the solution and put the wet rod on non-luminous flame

Observations	Inferences
(½ mk)	(½ mk)

iv) To the 3rd portion add three drops of barium nitrate solution, followed by 2cm³ of 2M nitric acid solution.

Observations	Inferences
(1mk)	(1mk)

- v) To the 4th portion add three drops of acidified potassium dichromate (vi) solution

Observations	Inferences
(½ mk)	(½ mk)

3. You are provided with solid R. Carryout the following tests and record your observations and inferences in the spaces provided.

- a) To half of solid R, put in a dry test tube, add 5cm³ of absolute ethanol and shake the mixture thoroughly. Divide the mixture into two equal parts

Observations	Inferences
(1mk)	(1mk)

- i) To the first portion dip the universal indicator paper and determine its pH

Observations	Inferences
(½ mk)	(½ mk)

ii) To the 2nd portion add half of sodium carbonate solid provided.

Observations	Inferences
(½ mk)	(½ mk)

b) Place the remaining solid R into a boiling tube and add 10cm³ of water and shake thoroughly.

i) To the first 2cm³ add 4 – 5 drops of acidified potassium manganate (vii) solution then warm

Observations	Inferences
(½ mk)	(½ mk)

ii) To the second 2cm³ add about 2cm² acidified potassium dichromate (vi) solution

Observations	Inferences
(½ mk)	(½ mk)

iii) To the 3rd 2cm³ add the remaining sodium carbonate solid

Observations	Inferences
 (½ mk)	 (½ mk)