

**CONFIDENTIAL**  
**BIOLOGY**  
**PRACTICAL**  
**Dec. 2022**



**INSTRUCTIONS TO SCHOOLS**

The information contained in this paper is to enable the head of the school and the teacher in charge of Biology to make adequate preparations for this year's Biology Practical examination.

**NO ONE ELSE** should have access to this paper or acquire knowledge of its contents. Great care **MUST** be taken to ensure that the information herein does **NOT** reach the candidate either directly or indirectly. The teacher or laboratory technician in charge of Biology should **NOT** perform any of the experiments or give any information related to these instructions to the candidates.

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**These instructions consist of 2 printed pages.**



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(a) Besides other laboratory apparatus and fittings, each candidate will require the following.

1. Half a portion of hard raw banana
2. Three 100 ml glass beakers
3. Access to a light microscope (provide low and medium power only) in the ratio 1:40
4. A scalpel
5. A spatula/pair of forceps
6. A white plain paper/white tile
7. Any green grass species with at least three leaves and roots
8. Three dry maize seeds
9. Stopwatch/access to means of timing
10. 50 cm<sup>3</sup> of solution G

(b) Each examination centre will be required to provide the following:

1. Distilled water, about 150 cm<sup>3</sup> per candidate
2. A piece of tissue paper/serviette
3. Hydrochloric acid (about 5 ml of the concentrated acid per candidate)

(c) Further instructions on the preparation of solution G, some procedures and materials will be provided at a later date by the Kenya National Examinations Council.

**Note:** All examination centres are required to make adequate arrangements for the provision of all the materials and specimens listed in (a) and (b) above.

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**CONFIDENTIAL**  
**PHYSICS**  
**PRACTICAL**  
**Dec. 2022**



**INSTRUCTIONS TO SCHOOLS**

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1. The information contained in this paper is to enable the head of the school and the teacher in charge of Physics to make adequate preparations for this year's Physics practical examination. **No one else** should have access to this paper or acquire knowledge of its contents. Great care **must** be taken to ensure that the information herein does **not** reach the candidates either directly or indirectly.
  2. The apparatus required by each candidate for the Physics practical examination are set out. It is expected that the ordinary apparatus of a Physics laboratory will be available.
  3. The **Physics teacher** should note that it is his/her responsibility to ensure that each apparatus acquired for this examination agrees with the specifications given.
  4. The question paper will **not** be opened in advance.
  5. The **Physics teacher** is **not** expected to perform the experiments.

**NB:**

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- *The Physics teacher must ensure that the laboratory is set up a day before the date of the examination.*
  - *Any use of apparatus other than the ones specified may lead to candidates being penalised.*
  - *The requirements for each question should not be written on the chalkboard on the day of the examination.*

**These instructions consist of 2 printed pages.**



### Question 1

Each candidate will require the following:

1. A metre rule.
2. A plain white screen labelled  $S_2$ .
3. A white screen with crosswires at the centre labelled  $S_1$ .
4. A convex lens of focal length  $10 \pm 1.0$  cm mounted on a lens holder such that its centre is at the same height as the crosswires on screen  $S_1$ .
5. A candle (when the candle is lit, the flame, the crosswires and the lens should be at the same height).

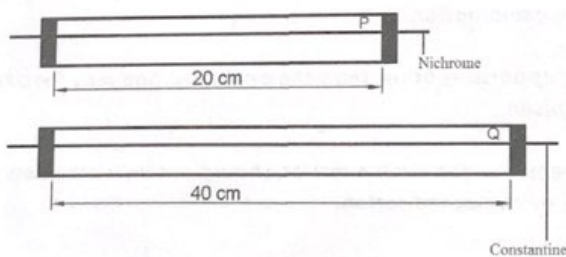
NB: The sides of the screens should have a minimum length of 15 cm.

### Question 2

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1. A piece of strong sewing thread approximately 120 cm long.
2. A metre rule.
3. An equilateral triangular glass prism of dimension approximately  $40 \text{ mm} \pm 0.02 \text{ mm}$ .
4. One 50 g mass.
5. A boss, a clamp and a stand.
6. Some tissue paper.
7. An ammeter (0 – 1 A).
8. A voltmeter (0 – 5 V).
9. 200 ml of water in a beaker labelled water.
10. 200 ml of glycerine in a beaker labelled **Liquid L**.
11. A nichrome resistance wire of length 21 cm and diameter  $0.27 \pm 0.01$  mm mounted on a cardboard or piece of wood labelled **P**.
12. A constantine resistance wire of length 41 cm and diameter  $0.36 \pm 0.01$  mm mounted on a cardboard or piece of wood labelled **Q**.

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13. A switch S.
14. Two new size D dry cells in a cell holder.
15. Nine connecting wires (five wires to have crocodile clips at both ends, and at least 2 with the clips at one end).  
NB: Each connecting wire should have a minimum length of 40 cm.
16. Any resistance wire of length 102 cm mounted on a metre rule with one end labelled A and the other end labelled B (a slightly longer wire is used to allow for connections).
17. A centre zero galvanometer.
18. A jockey.



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Kenya Certificate of Secondary Education, 2021  
232/3 Inst. Sch.

233/3 Inst. Sch.

Paper 3

**CONFIDENTIAL**  
**CHEMISTRY**  
**PRACTICAL**  
**Dec. 2022**



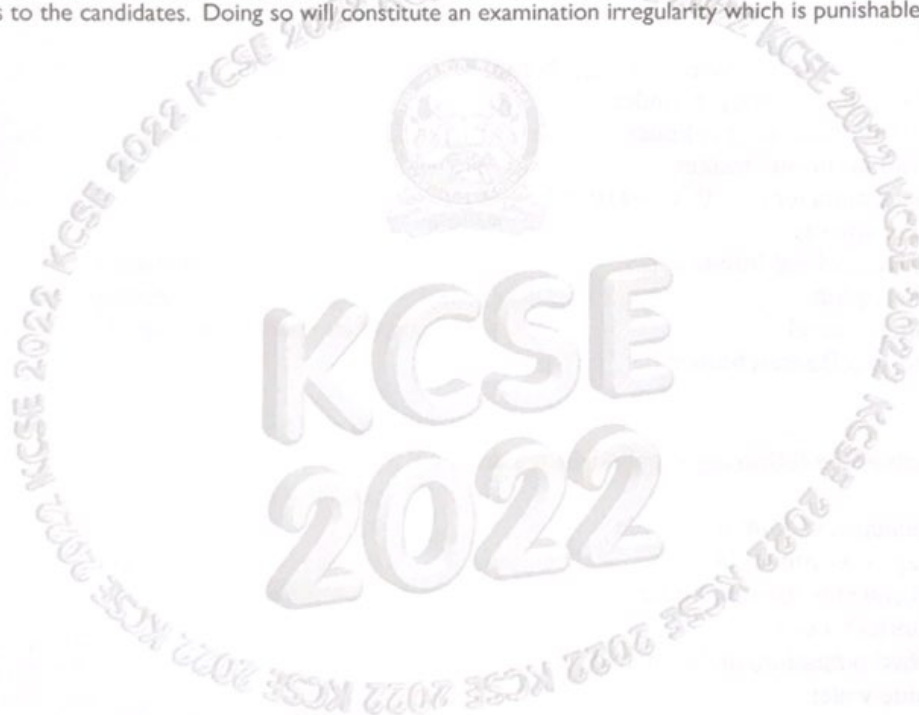
**INSTRUCTIONS TO SCHOOLS**

The information contained in this paper is to enable the head of the school and the teacher in charge of Chemistry to make adequate preparations for this year's Chemistry practical examination.

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**No one else** should have access to this paper or acquire knowledge of its contents. Great care **must** be taken to ensure that the information herein does not reach the candidates either directly or indirectly. The teacher in charge of Chemistry should **not** perform any of the experiments in the same room as the candidates nor make the results of the experiments available to the candidates or give any other information related to the experiments to the candidates. Doing so will constitute an examination irregularity which is punishable.

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**These instructions consist of 8 printed pages.**



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In addition to the fittings and chemicals found in a chemistry laboratory, each candidate will require the following:

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1. 5 cm<sup>3</sup> of solution A supplied with a dropper
  2. 100 cm<sup>3</sup> of solution B
  3. 120 cm<sup>3</sup> of solution C1
  4. 5.0 g of **solid D**. This should be provided in two portions each **2.5 g** accurately weighed in stoppered containers. Label each as **solid D**.
  5. 0.5 g of **solid M** in a stoppered container
  6. 15 cm<sup>3</sup> of **solution N** in a boiling tube
  7. A piece of aluminium foil (2cm × 2cm)
  8. 0.2 g of sodium carbonate in a stoppered container
  9. 8 dry test tubes
  10. One boiling tube
  11. Test tube rack
  12. 25 ml pipette and a pipette filler
  13. 50 ml burette
  14. 250 ml volumetric flask
  15. Two 250 ml conical flasks
  16. One label
  17. 600 cm<sup>3</sup> of distilled water in a wash bottle
  18. One 100 ml measuring cylinder
  19. One 10 ml measuring cylinder
  20. One 100 ml plastic beaker
  21. One thermometer ( -10 °C – 110 °C)
  22. Metallic spatula
  23. Two pieces of red litmus papers
  24. Burning splint
  25. One filter funnel
  26. Access to a Bunsen burner

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Access to each of the following supplied with a dropper:

1. 2 M aqueous sodium hydroxide
2. 2 M aqueous ammonia
3. 0.1 M aqueous barium nitrate
4. 2 M nitric(V) acid
5. Acidified potassium dichromate(VI)
6. Bromine water



## PREPARATIONS

1. Solution A is prepared by placing 0.2 g of methyl orange powder in 250 ml beaker, adding 100 cm<sup>3</sup> of distilled water and stirring to dissolve. Label this as **solution A**.
2. Solution B is prepared by placing 19.2 g of **solid B** weighed accurately in a one litre volumetric flask, adding about 600 cm<sup>3</sup> of distilled water, shaking to dissolve, then adding distilled water to the mark. Label this as **solution B**.
3. **Solution C1** is prepared by adding 166.0 cm<sup>3</sup> of concentrated hydrochloric acid (density = 1.18 g cm<sup>-3</sup>) to about 600 cm<sup>3</sup> of distilled water in a one litre volumetric flask, then adding distilled water to the mark. Label this as **solution C1**.
4. **Solution N** is prepared by placing 33.3 g of **solid N1** and 33.3 g of **solid N2** in a one litre volumetric flask, adding about 600 cm<sup>3</sup> of distilled water, shaking to dissolve, then adding distilled water to the mark. Label this as **solution N**.
5. Acidified potassium dichromate(VI) is prepared by placing 25.0 g of potassium dichromate(VI) in a one litre volumetric flask, adding about 400 cm<sup>3</sup> of 2 M sulphuric(VI) acid, followed by about 400 cm<sup>3</sup> of distilled water and shaking to dissolve, then adding distilled water to the mark. Label this as acidified potassium dichromate(VI).
6. Bromine water is prepared by adding 2 cm<sup>3</sup> of liquid bromine to 100 cm<sup>3</sup> of distilled water in a 250 ml beaker, stirring and then transferring into a reagent bottle. Label this as bromine water. (The bromine water should be shaken well when dispensing.)
7. Aqueous barium nitrate is prepared by placing 25.0 g of barium nitrate in a one litre volumetric flask, adding about 600 cm<sup>3</sup> of distilled water, shaking to dissolve, then adding distilled water to the mark. Label this as aqueous barium nitrate.

### NOTE 1:

These instructions are for making one litre solutions except numbers 1 and 6 which are 500 cm<sup>3</sup> and 100 cm<sup>3</sup>, respectively. The teacher in charge should determine the volumes required for their centre and prepare accordingly.

### NOTE 2:

Solids **B**, **M**, **NI** and **N2** will be supplied by the Kenya National Examinations Council (KNEC).

### NOTE 3:

Solid **D**, sodium hydrogen carbonate is to be supplied by the centres.



This form **must** be completed and returned in the envelope containing the scripts.

**Kenya Certificate of Secondary Education**

**Mar. 2022**

**REPORT ON CHEMISTRY PRACTICAL 233/3**

The supervisor is required to:

- (a) give the names and index numbers of candidates in each session.
- (b) ask the teacher in charge of chemistry to perform the experiments in question 1 **(NOT IN THE SAME ROOM WITH CANDIDATES)** and write the results in the tables as per the question paper.
- (c) give the details of any difficulties experienced by particular candidates writing their names and index numbers on page 8.

Details required include:

- (i) difficulties caused by faulty apparatus
- (ii) accidents caused by chemicals or apparatus
- (iii) physical handicap e.g colour blindness supported by medical evidence.

**Name of Supervisor:** .....

**Centre Number:** .....

**Signature:** .....

**Date:** .....

**Name of the teacher who performed the experiments:** .....

**TSC No:** .....

**Signature:** ..... **Date:** .....



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Candidates' Index Numbers

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**Question 1:** Draw and complete **table 2** as per the question paper.

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**Question 1:** Draw and complete **table 3** as per the question paper.

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