

THE KENYA NATIONAL EXAMINATIONS COUNCIL
Kenya Certificate of Secondary Education

231/3 (b) Inst. Sch.



Paper 3

CONFIDENTIAL
BIOLOGY (Practical)
Nov. 2023

INSTRUCTIONS TO SCHOOLS

- (a) 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.
- (b) **No one else** should have access to this paper or acquire knowledge of its contents.
- (c) Great care **must** be taken to ensure that the information herein **does not** reach the candidate either directly or indirectly.
- (d) 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.

These instructions consist of 3 printed pages.

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Besides the other fittings and apparatus in the laboratory, each candidate would require the following:

- (a)
- A scalpel
 - Two 100 ml beakers
 - A 30 cm ruler
 - (Access to) means of timing/stop watch
 - Two fresh, medium sized leaves of *Brassica oleracea* (Kale/ Sukuma Wiki)
 - Bean seedling, germinated three weeks before the examination day labelled E
 - Maize seedling, germinated three weeks before the examination day labelled F
 - Bougainvillea twig with at least three leaves labelled G
 - Distilled water (about a litre for 10 candidates)
 - Six test tubes
 - Means of labelling (about five pieces)
 - A 10 ml measuring cylinder- 3 pieces
 - 5 cm³ each of solutions K₁ and K₂
 - A white tile
 - 5 cm³ each of solutions L₁, L₂ and L₃
 - A dropper
 - Iodine crystals about 0.05 g per candidate
 - 2 cm³ of hydrochloric acid in a test tube.

(b) **Preparation of solutions**

1. **Solution K₁**
This is 5 cm³ distilled water in a test tube and supplied to each candidate, labelled solution K₁.
2. **Solution K₂**
Solution K₂ is prepared by dissolving all of substance K supplied in 7x cm³ of distilled water, where x is the number of candidates. Supply each candidate with about 5 ml of the solution, labelled **Solution K₂** in a test tube.
3. **Solution L₁**
Solution L₁ is prepared by placing all of the substance L supplied in a beaker. Add a little water and stir to make a paste. Add 7x cm³ of boiling distilled water and stir thoroughly, where x is the number of candidates.

Supply each candidate with about 5 ml of the solution, labelled **solution L₁**.
This solution **should be prepared in the morning** of the day of the examination.
4. **Solution L₂**
This solution **should be prepared in the morning** of the day of the examination using substance M supplied.

Dissolve the entire substance M in $7x \text{ cm}^3$ of distilled water, where x is the number of candidates. Supply each candidate with about 5ml of the solution labelled solution L_2 .

Solution L_3

Solution L_3 is prepared in using the concentrated hydrochloric acid procured by the examination centres. To prepare the solution, 180 cm^3 of concentrated hydrochloric acid is carefully poured in about 800 cm^3 of distilled water, stirred and made up to 1 litre. About 5 cm^3 of the same is supplied to each candidate, labelled hydrochloric acid.

5. **Iodine solution**

Iodine solution is prepared using substance N supplied and substance P (iodine procured by the school). Dissolve $\frac{5}{100} x$ grams of solid P (iodine) plus all of solid N supplied in $7x \text{ cm}^3$ of distilled water where x is the number of candidates. Thoroughly stir the mixture to dissolve. Label as **iodine solution** and supply each candidate with about 5ml.

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