

1903/103
AGRICULTURAL PRODUCTION AND
MICROBIOLOGY
Oct./Nov. 2022
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

**CRAFT CERTIFICATE IN FOOD PROCESSING AND PRESERVATION
TECHNOLOGY**

MODULE I

AGRICULTURAL PRODUCTION AND MICROBIOLOGY

3 hours

INSTRUCTIONS TO CANDIDATES

This paper consists of TWO sections; A and B.

Answer ALL the questions in section A and any TWO questions from section B in the answer booklet provided.

Each question in section A carries 4 marks while each question in section B carries 20 marks.

Maximum marks for each part of a question are as shown.

Candidates should answer the questions in English.

This paper consists of 3 printed pages.

**Candidates should check the question paper to ascertain that
all the pages are printed as indicated and that no questions are missing.**

SECTION A (60 marks)

Answer ALL the questions from this section.

1. Define each of the following terms:
 - (a) microbiology; (2 marks)
 - (b) microorganism. (2 marks)
2. Name **four** types of microscopes. (4 marks)
3. State **one** function of each of the following parts of a microscope:
 - (a) diaphragm; (1 mark)
 - (b) condenser; (1 mark)
 - (c) objective lenses; (1 mark)
 - (d) stage. (1 mark)
4. Name **four** equipment used in land preparation. (4 marks)
5. Explain **two** requirements for agricultural production. (4 marks)
6. List **four** properties of planting materials. (4 marks)
7. State **four** differences between eukaryotic cell and prokaryotic cell. (4 marks)
8. Identify **four** extrinsic factors affecting growth of micro-organisms. (4 marks)
9. List **four** components of a culture medium. (4 marks)
10. State **four** physical indicators of crop maturity. (4 marks)
11. Describe **two** methods of land preparation. (4 marks)
12. Explain the importance of plant nurseries in agricultural production. (4 marks)
13. List **four** care and safety precaution practices when handling a light microscope. (4 marks)
14. Name **four** common insect pests in the field. (4 marks)
15. List **four** ecological factors influencing crop production. (4 marks)

SECTION B (40 marks)

Answer any TWO questions from this section.

16. (a) Define each of the following as used in microbiology:
- (i) culture media; ✓ (1 mark)
 - (ii) colony forming unit. (2 marks)
- (b) Describe the following phases of bacterial growth:
- (i) lag phase; (3 marks)
 - (ii) log phase. (3 marks)
- (c) State six general applications of microorganisms. ✓ (6 marks)
- (d) Outline the procedure for gram staining of a fixed smear. (5 marks)
17. (a) Explain five methods of land improvement. (10 marks)
- (b) Describe five methods of controlling field crop diseases. (10 marks)
18. (a) Outline the following staining procedures:
- (i) acid fast staining; (4 marks)
 - (ii) capsule staining. (4 marks)
- (b) Describe four methods used in enumeration of micro-organisms from a given sample. (12 marks)
19. (a) State the importance of crop rotation in agricultural production. (6 marks)
- (b) Explain three storage conditions for crop produce. (6 marks)
- (c) Describe four agricultural production methods. (8 marks)

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