

1903/103

**AGRICULTURAL PRODUCTION  
AND MICROBIOLOGY**

Oct./Nov. 2021

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**

*You should have an answer booklet for this examination:*

*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 4 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 in this section.*

1. State **four** factors which have contributed to the development of poultry farming in Kenya in the recent years. (4 marks)
2. Identify **four** practices undertaken in the control of pests and diseases in reared livestock. (4 marks)
3. Differentiate between each of the following:
  - (a) root and stem tubers; (2 marks)
  - (b) seed dressing and seed inoculation. (2 marks)
4. State **four** reasons for the increase in popularity of organic farming in recent years in Kenya. (4 marks)
5. Explain the use of the subsoiler in agricultural production. (4 marks)
6. Name **four** methods of layering as used in plant propagation. (4 marks)
7. State **four** advantages of agricultural extension to a small scale farmer. (4 marks)
8. Explain **four** methods of controlling parasites in bee keeping. (4 marks)
9. State the functions of each of the following parts of a light microscope:
  - (a) condenser; (2 marks)
  - (b) revolving nosepiece. (2 marks)
10. State **four** benefits of studying microbiology for a food processing and preservation technology student. (4 marks)
11. Name the **four** main types of bacteria cells based on their shapes. (4 marks)
12. Explain the application of acid fast staining of micro-organisms. (4 marks)
13. Explain asexual reproduction in yeasts. (4 marks)
14. State **four** disadvantages of direct microscopic count of microorganisms. (4 marks)
15. State **four** methods through which water is made unavailable in the control of microbial growth. (4 marks)

**SECTION B (40 marks)**

*Answer any TWO questions from this section.*

16. (a) Name **four** methods of post harvest preservation of fish. (4 marks)
- (b) State **six** side-effects of parasites to domestic animals. (6 marks)
- (c) Explain **five** indicators of maturity in fruits and vegetable crops. (10 marks)
17. (a) Name **three** classifications of microorganisms based on their growth temperature requirement. (3 marks)
- (b) State **three** reasons for onset of stationary phase in microbial growth. (3 marks)
- (c) Table I shows classification of microorganisms.

**Table I:**

Level of classification	Microorganism A	Microorganism B
Domain	Bacteria	Bacteria
Phylum	Firmicutes	Proteobacterium
(1)	Bacilli	Gammaproteobacteria
Order	Bacillales	Enterobacteriales
(2)	Staphylococcaceae	Enterobacteriaceae
(3)	Staphylococcus	Escherichia
Species	Aureus	Coli

- (i) Identify the levels of classification represented by 1, 2 and 3. (3 marks)
- (ii) Write the scientific name of each bacteria. (2 marks)
- (d) Explain the sterilization of:
- (i) the spreader glass rod; (4 marks)
- (ii) growth media. (5 marks)

18. (a) Name **four** parasites found in cattle. (4 marks)
- (b) Explain **three** measures taken during the harvesting of sugarcane to ensure high quality (6 marks)
- (c) Describe the conditions used in promoting rooting of cuttings. (10 marks)
19. (a) State the functions of each of the following components of microbial growth media:
- (i) sodium chloride; (1 mark)
- (ii) water; (3 marks)
- (iii) peptone. (2 marks)
- (b) State **four** aseptic procedures carried out during pour plating. (4 marks)
- (c) Explain **five** factors influencing the effectiveness of a chemical disinfectant. (10 marks)

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