

2913/104  
AGRICULTURAL PRODUCTION AND  
GENERAL MICROBIOLOGY  
June/July 2020  
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL  
DIPLOMA IN FOOD SCIENCE AND PROCESSING TECHNOLOGY

MODULE I

AGRICULTURAL PRODUCTION AND GENERAL MICROBIOLOGY

3 hours

INSTRUCTIONS TO CANDIDATES

*You should have the following for this examination:*

*answer booklet;*

*non-programmable scientific calculator.*

*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 15 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 questions in this section.*

1. (a) Differentiate between sterilization and disinfection. (2 marks)
- (b) State **six** characteristics of an ideal disinfectant. (6 marks)
- (c) Explain tyndillization method of sterilization. (7 marks)
  
2. (a) Define acidophiles. (1 mark)
- (b) Differentiate between each of the following:
  - (i) psychrophiles and psychrotrophs; (2 marks)
  - (ii) halophiles and haloduric. (2 marks)
- (c) Explain the classification of micro-organisms based on their gaseous requirement. (10 marks)
  
3. (a) State **five** significance of primary cultivation. (5 marks)
- (b) Explain **five** benefits of using nurseries in crop propagation. (5 marks)
- (c) Explain land preparation. (3 marks)
- (d) List **two** benefits of applying lime on prepared land for crop production. (2 marks)
  
4. (a) State **five** tools used in land preparation indicating the function of each tool. (10 marks)
- (b) State **five** benefits of agricultural production. (5 marks)



**SECTION B (40 marks)**

*Answer any TWO questions from this section.*

5. (a) (i) Define selective media. (1 mark)
- (ii) State five ways of achieving selection by selective media. (5 marks)
- (b) State four advantages of solid media as opposed to broth. (4 marks)
- (c) The composition of nutrient agar is as shown in table I:

**Table I**

Constituent	Quantity
Peptone	5.0 g
Beef extract	3.0 g
Agar	15.0 g
Water	1000 mL

- (i) Explain the classification of the above media stating its application. (7 marks)
- (ii) State three ways of improving the medium to culture fastidious organisms. (3 marks)
6. (a) State seven advantages of membrane filtration method of enumeration. (7 marks)
- (b) With the aid of a labelled diagram, describe the hanging drop technique. (8 marks)
- (c) State five precautions observed before the storage of microscopes. (5 marks)
7. (a) (i) Define steaming up as used in animal husbandry. (1 mark)
- (ii) Explain the importance of steaming up in animal husbandry. (5 marks)
- (b) Explain seven factors considered when selecting a breeding stock. (14 marks)
8. (a) State three harmful effects of crop diseases. (3 marks)
- (b) List seven traditional methods used in control of crop diseases. (7 marks)
- (c) Explain five harmful effects of crop pests. (10 marks)

**THIS IS THE LAST PRINTED PAGE.**