

2913/104
AGRICULTURAL PRODUCTION
AND GENERAL MICROBIOLOGY
Oct./Nov. 2022
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 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 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 the questions in this section.

1. (a) Define each of the following branches of agriculture:
- (i) aquaculture; (2 marks)
 - (ii) apiculture; (2 marks)
 - (iii) horticulture. (2 marks)
- (b) Explain the effect of each of the following ecological factors on crop production:
- (i) altitude; (3 marks)
 - (ii) soil; (3 marks)
 - (iii) topography. (3 marks)
2. (a) (i) Define a weed. (2 marks)
- (ii) State five harmful effects of weed to agricultural production. (5 marks)
- (b) Differentiate between each of the following:
- (i) broadcasting and row planting; (4 marks)
 - (ii) plant production and seed rate. (4 marks)
3. (a) State five properties of agar favouring its use in solid culture media. (5 marks)
- (b) Explain the importance of each of the following types of culture media:
- (i) selective media; (3 marks)
 - (ii) enrichment media. (3 marks)
- (c) Explain tyndalisation. (4 marks)
4. (a) State five functions of the bacterial cell wall. (5 marks)
- (b) Explain five factors which influence sterilization of laboratory apparatus by heat. (10 marks)

SECTION B (40 marks)

Answer any TWO questions from this section.

5. (a) State **four** differences between endospores and exospores. (8 marks)
- (b) Discuss the importance of microorganisms in the food industry. (12 marks)
6. (a) State **four** types of microscopes used in the microbiology laboratories. (4 marks)
- (b) Explain the application of each of the following factors in the control of microbial growth:
- (i) pH; (3 marks)
 - (ii) temperature; (4 marks)
 - (iii) water activity (a_w). (4 marks)
- (c) With the aid of a diagram, describe the streaking method of bacteria isolation. (5 marks)
7. (a) State **six** advantages of using seeds as planting material. (6 marks)
- (b) Describe **four** methods of controlling parasites in livestock. (8 marks)
- (c) Explain **three** advantages of harvesting of fruit crops at their optimum maturity. (6 marks)
8. (a) State **five** disadvantages of machine harvesting of crops. (5 marks)
- (b) State **five** hygiene practices observed during milking. (5 marks)
- (c) Explain **five** factors considered while selecting a nursery site. (10 marks)

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