

1903/202  
FOOD CHEMISTRY AND  
FOOD MICROBIOLOGY  
Oct./Nov. 2019  
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL  
CRAFT CERTIFICATE IN FOOD PROCESSING AND PRESERVATION  
TECHNOLOGY

MODULE II

FOOD CHEMISTRY AND FOOD 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 4 marks while each question in section B carries 20 marks.*

*Maximum marks for each part of a question are as indicated.*

*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.**

Biological

Gram staining

Staphylococcus aureus

Escherichia coli  
botulism

## SECTION A (60 marks)

Answer ALL questions in this section.

1. Name **four** classes of food constituents. (4 marks)  
*Protein, Lipid, Carbohydrates*
2. List **four** major types of microorganisms. (4 marks)  
*Salmonella, Escherichia coli, Clostridium botulinum*
3. Explain how reducing sugars and non-reducing sugars are identified using copper reduction test. (4 marks)  
*Reducing sugar - Has the ability to reduce copper(II) oxide to copper(I) oxide. While non-reducing sugar - does not have the ability to reduce copper(II) oxide to copper(I) oxide.*
4. State **four** effects of microbial spoilage of liquid food. (4 marks)
5. Differentiate between essential and non-essential amino acids. (4 marks)  
*Essential amino acid - are amino acid synthesised by the human body. Non-essential amino acids - are " " which are not synthesised by the human body.*
6. Describe selective media used in microbiological assessment of foods. (4 marks)  
*Seroli*
7. State **four** uses of lipids in food industry. (4 marks)  
*It helps in acid nutrients in food when being processed. Helps in*
8. Explain the occurrence of faecal coliforms in food. (4 marks)
9. State **four** functions of calcium in human nutrition. (4 marks)
10. Name **four** bacterial genera which are common causes of food borne infections. (4 marks)
11. Describe **four** deficiency symptoms of vitamin B2 in human nutrition. (4 marks)  
*causes rickets, causes blindness, causes Anaemia*
12. Explain the use of filtration as a method of food sterilisation. (4 marks)
13. Describe the nutritional significance of water. (4 marks)  
*importance: Mobility spermatozoa, Act as a solvent, cleaning agent, Necessary for enzymatic catalysed reaction*
14. Explain the application of bacteria in yoghurt processing. (4 marks)
15. List **four** general classes of food additives. (4 marks)  
*Benzoic acid, Antibiotics, Flavouring agent, Sulphur(IV)oxide, Colour*

## SECTION B (40 marks)

Answer any **TWO** questions from this section.

16. Outline the gram staining procedure. (20 marks)
17. Discuss the routes of food contamination. (20 marks)  
*Animal ✓  
Animal feed ✓  
Hygiene / Food handlers ✓  
Plants, Water, Soil ✓*

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Saponification

Hygiene - refers to killing of microbes and cleanliness to avoid growth of microbes

18. (a) Name the natural toxins associated with each of the following foods:
- (i) potatoes; (1 mark)
  - (ii) red kidney beans; (1 mark)
  - (iii) cassava; (1 mark)
  - (iv) cotton seed oil. (1 mark)
- (b) Explain the application of each of the following methods of detoxification of food:
- (i) fermentation; (4 marks)
  - (ii) boiling; (4 marks)
  - (iii) soaking;- (4 marks)
  - (iv) trimming;- (4 marks)

19. \* Explain five methods of controlling microorganisms in food. (20 marks)

- Personal hygiene,
- Raw foods shld be kept away from cooked food,
- Proper sanitization of equipments,
- Food should not be kept at Low temp.

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