2913/302
FOOD CHEMISTRY II AND
FOOD MICROBIOLOGY II
June/July 2022
Time: 3 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN FOOD SCIENCE AND PROCESSING TECHNOLOGY

MODULE III

FOOD CHEMISTRY II AND FOOD MICROBIOLOGY II

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

Turn over

SECTION A (60 marks)

Answer ALL the questions in this section.

1. (a) State **three** factors which affect the stability of anthocyanins during food processing. (3 marks)

   (b) Differentiate between exotoxins and endotoxins as used in food microbiology. (4 marks)

   (c) Explain **four** methods of preserving green colour in foods during processing. (8 marks)

2. (a) State **four** characteristics of clostridium botulinum. (4 marks)

   (b) Name **three** mycotoxins of economic significance in the food industry. (3 marks)

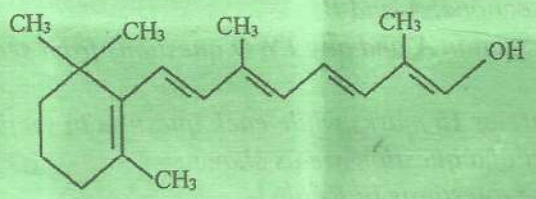
   (c) Explain each of the following as used in biotechnology:

   (i) recombinant DNA (rDNA); (2 marks)
   (ii) cloning. (2 marks)

   (d) (i) Name **two** enzymes produced through genetic engineering. (2 marks)

   (ii) State the use of the enzymes named in (d)(i) above. (2 marks)

3. (a) Name the vitamin shown in the following structure. (2 marks)



   (b) State **seven** functions of the vitamin shown in (a) above. (7 marks)

   (c) State the deficiency disease and symptoms of the vitamin in (a) above. (6 marks)

4. (a) Name **five** types of undesirable flavours of concern in a food processing industry. (5 marks)

   (b) Explain **five** benefits of biotechnology in agriculture. (10 marks)

SECTION B (40 marks)

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

5. (a) State **six** symptoms of protein malnutrition in children. (6 marks)

(b) Explain the importance of riboflavin in the human body. (4 marks)

(c) Explain **five** factors which affect the absorption of iron in human nutrition. (10 marks)

6. Discuss each of the following with reference to shigellosis:

(a) characteristics of causative micro-organism; (6 marks)

(b) incubation period and symptoms of attack; (6 marks)

(c) food sources of the micro-organism; (4 marks)

(d) control of the infection. (4 marks)

7. (a) Describe each of the following browning reactions:

(i) Maillard reaction; (5 marks)
(ii) Caramelization. (5 marks)

(b) Explain the colour changes of myoglobin upon exposure to oxygen. (10 marks)

8. (a) Identify the micro-organism that cause each of the following zoonoses:

(i) tuberculosis; (1 mark)
(ii) Q-fever; (1 mark)
(iii) brucellosis; (1 mark)
(iv) Rift Valley fever; (1 mark)
(v) anthrax. (1 mark)

(b) Explain the meaning of each of the following as used in food microbiology:

(i) food borne infection; (2 marks)
(ii) food borne intoxication. (2 marks)

(c) Discuss the effects of aflatoxin poisoning in the human body. (11 marks)

THIS IS THE LAST PRINTED PAGE.