1903/104
FOOD ENGINEERING I
Oct./Nov. 2019
Time: 3 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL

CRAFT CERTIFICATE IN FOOD PROCESSING AND PRESERVATION TECHNOLOGY

MODULE I

FOOD ENGINEERING I

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 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) Explain the importance of colour coding in the food industry. (2 marks)

   (b) Name **four** utilities which need to be colour coded in the food industry. (2 marks)

2. State **four** advantages of steam as a heat source in the food processing industry. (4 marks)

3. Name **four** unsafe conditions that cause materials handling accidents. (4 marks)

4. (a) Define cleaning. (2 marks)

   (b) List **four** types of contaminants found in food raw materials. (2 marks)

5. Explain **two** requirements of an acceptable cleaning operation. (4 marks)

6. State **four** defects that affect the process suitability of food raw materials. (4 marks)

7. (a) Explain the meaning of contract purchasing. (2 marks)

   (b) State **two** terms of a contract purchase. (2 marks)

8. List **four** reasons for sorting food raw materials. (4 marks)

9. State **four** reasons for good material handling. (4 marks)

10. State **four** precautions that must be taken to ensure safety in a food industry. (4 marks)

11. Name **two** operational and **two** safety accessories fitted on boilers. (4 marks)

12. List **eight** basic contents of a first aid box. (4 marks)

13. (a) Name **four** sources of water used in a food industry. (2 marks)

    (b) List **four** major impurities found in water. (2 marks)

14. State **four** factors considered when selecting a site for a food processing industry. (4 marks)

15. State **two** advantages and **two** disadvantages of using sodium hydroxide (NaOH) as an inorganic alkaline detergent for plant hygiene. (4 marks)

SECTION B (40 marks)

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

16. Discuss each of the following in hygienic design and construction of food factories:

(a) construction of floors; (8 marks)

(b) nature and materials for construction of food contact surfaces. (12 marks)

17. (a) (i) List **six** types of factory wastes. (3 marks)

(ii) Explain the meaning of biological oxygen demand (BOD). (2 marks)

(b) Discuss each of the following:

(i) heat sterilization of food processing equipment; (7 marks)

(ii) trickling filters as a method of liquid waste disposal. (8 marks)

18. (a) Explain the effects of each of the following on materials conveying using chutes:

(i) angle of inclination; (2 marks)
(ii) chute length; (2 marks)
(iii) uniformity of package weight. (2 marks)

(b) State **four** factors considered when selecting wheels for materials handling trucks. (4 marks)

(c) Discuss each of the following in raw materials:

(i) mechanical harvesting; (5 marks)
(ii) storage at the factory before use. (5 marks)

19. (a) (i) State **two** advantages and **two** disadvantages of in-place cleaning. (4 marks)

(ii) Explain **two** disadvantages of manual grading. (4 marks)

(b) Explain each of the following:

(i) **four** factors that affect the efficiency of spray washing. (4 marks)

(ii) **three** ways of improving the efficiency of soaking stating one limitation of each. (6 marks)

(iii) explain the importance of the factory act. (2 marks)

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