

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

THIRD YEAR EXAMINATION FOR THE AWARD OF DEGREE  
OF BACHELOR OF SCIENCE IN AGRICULTURAL EDUCATION

FOST 336: FOOD PLANT DESIGN AND LAYOUT

STREAMS: BSC (FOST)

TIME: 2 HOURS

DAY/DATE: THURSDAY 06/04/2020

2.30 P.M. – 4.30 P.M.

**INSTRUCTIONS:**

- Answer ALL questions in section A and any TWO in section B
- Do not write anything on the question paper. ALL rough work to be done on the answer booklet and crossed through

**SECTION A: ANSWER ALL QUESTIONS (30 MARKS)**

1. Explain the circumstances that may require a design of a food processing plant [8 marks]
2. How do the following utilities affect the design and layout of a food plant?
  - (a) Steam [3 marks]
  - (b) Effluents [3 marks]
3. Knowledge of symbols is important for proper execution of a plant design and layout. Explain eight major line symbols used in a food plant and their interpretations [8 marks]
4. Describe how you would perform a detailed technical analysis for a proper food plant design [8 marks]

**SECTION B: ANSWER ANY TWO QUESTIONS (40 MARKS)**

5. Consider a small scale milk processing plant whose product portfolio includes fresh milk, yoghurt and mala. Suggest practical guidelines for the design and construction of the plant with regards to
  - (a) Materials of construction of the plant [7 marks]
  - (b) Illumination and ventilation of the plant [7 marks]
  - (c) Cleaning and sanitation of the plant [6 marks]

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6. Plant location decisions are strategic and long-term in nature, which means that if they are not carefully taken, continuous operating disadvantages could result. With examples describe how the following approaches are used to evaluate plant location sites, citing the merits and demerits of each
- (a) Equal weights method [5 marks]
  - (b) Variable weights method [5 marks]
  - (c) Weight cum rating method [5 marks]
  - (d) Composite measure method [5 marks]
7. You are having a conversation with your new CEO on the possibilities of opening a new processing plant because the old plant is overwhelmed. The CEO has asked your opinion on appropriate layout for the new plant. What would be your response with reference to the following types of plant layout? Use appropriate sketches and give advantages and disadvantages of each layout
- (a) Product layout [7 marks]
  - (b) Process layout [7 marks]
  - (c) Cellular layout [6 marks]
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