



**DEDAN KIMATHI UNIVERSITY OF TECHNOLOGY**  
**UNIVERSITY EXAMINATIONS 2019/2020**  
**SECOND YEAR FIRST SEMESTER EXAMINATION FOR THE**  
**BACHELOR OF SCIENCE DEGREE IN NUTRITION AND DIETETICS,**

**FND 2104: MICRONUTRIENTS**

**DATE: 16<sup>TH</sup> November, 2020**

**TIME: 11.00pm-1.00pm**

**INSTRUCTIONS TO CANDIDATES:**

- This paper consists of two sections A and B.
- Answer all questions in section A and any other two (2) in section B.  
Section A= 30 marks  
Section B = 40 marks.

**Section A- [30 Marks].**

**Question One**

- a) One of the most prominent clinical signs in iodine deficiency is the enlargement of the thyroid gland called “goitre”. However, apart from being an aesthetic problem, this is of marginal clinical significance? Why then do we consider iodine deficiency a public health problem? Give the three most important reasons. (3 marks).
- b) Explain how geological phenomenon could contribute to low iodine intake (3 marks).
- c) Explain how the following goitrogenic factors could contribute to the aetiology of iodine deficiency disorders. Motivate your response with specific sources of the goitrogens where possible.
- i. Thiocyanates (2 marks).
  - ii. Thiouracyl (1 mark).
- d) In a region it is said that there is a lot of iodine deficiency. How would you evaluate this rumour? (2 marks).

**Question Two**

- a) In populations consuming a diet containing 8 mg iron per 1000 kcalories we can still find iron deficiency. How can you explain this? (3 marks).



- b) Vitamin C deficiency is a rare event. But in certain circumstances infants can be affected by it. What are the circumstances that induce the associated symptoms in infants (3 marks).
- c) Recently well-known epidemiologist gave a speech on relationship between milk consumption and bone health entitled: "**Should we drink the milk of our cow or take her out for a walk?**". What controversy is covered by this title? (3 marks).

### Question Three

- a) Explain the principle of the push and pull strategy in nutrition promotion. (2 marks).
- b) Illustrate your answer in the case of
- sodium intake (worldwide), and (2 mark).
  - vitamin A intake (developing countries). (2 mark).
- c) In North west of China, the diet is cereal based which is unrefined. The winters are long and cold. After the winter many children are found to have small bone deformities, in particular enlargements of the wrists and of the costo-chondral junctions.
- What is this and how do you explain this situation? (2 marks).
  - What would you suggest to control this problem? (2 marks).

## **SECTION B – [40 MARKS]**

### Question Four

- a) For controlling micronutrient deficiencies, we have usually three possible strategies: food diversification, supplementation and food fortification. What is the best strategy and why, for the following deficiencies?
- Vitamin A deficiency (2 marks).
  - Iron deficiency (2 marks).
  - Iodine deficiency (2 marks).
- b) State and explain any THREE possible causes of folate deficiencies in human (6 marks).
- c) Discuss why women planning to conceive or pregnant women are always encouraged to take folate supplements (3 marks).
- d) State any THREE functions of vitamin E (3 marks).
- e) Suggest possible reasons for thiamine deficiency in rice-based diets in Asian countries (2 marks).



### Question Five

- a) Consumers are health conscious especially with regards to salt and sugar consumption. As a dietician, suggest measures that consumers can adopt to reduce their daily sodium intake (4 marks).
- b) Suggest any FOUR preventive measures to vitamin C deficiency (scurvy), (4 marks).
- c) Explain how Dietary Approaches to Stop Hypertension (DASH) diets contributes to reduction of sodium consumption (4 marks).
- d) Iron deficiency occurs most often due to inadequate iron intake. Which populations are frequently at risk of iron deficiency (microcytic anemia) and why? (8 marks).

### Question Six

- a) State any TWO vulnerable groups in a population that is at risk of developing clinical and biochemical vitamin A deficiency. Motivate your response. (3 marks).
- b) State THREE possible reasons why vitamin A deficiency disorders are considered a public health problem (3 marks).
- c) Explain how vitamin A helps in maintenance of epithelial cell integrity and vision (4 marks).
- d) Discuss the any FOUR factors that may alter and affect vitamin A requirement or needs (8 marks).
- e) State any FOUR signs and symptoms of chronic hypervitaminosis (2 marks).