

CHUKA



UNIVERSITY

## UNIVERSITY EXAMINATIONS

**EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE  
IN HUMAN NUTRITION AND DIETETICS**

**HNDS 123: MICRONUTRIENTS****STREAMS: B.Sc (HNDS) Y2S2****TIME: 2 HOURS****DAY/DATE: TUESDAY 11/04/2023****8.30 A.M. – 10.30 A.M.****INSTRUCTIONS:**

- Answer ALL questions
- Do not write anything on the question paper
- No use of mobile phones or any other unauthorized materials
- Write your answers legibly and use your time wisely

**SECTION A: MULTIPLE CHOICE QUESTIONS [ONE MARK EACH] [20 MARKS]**

1. A characteristic structural feature of vitamin B1 is the presence of:
  - A. A  $\beta$ -ionone ring
  - B. An isoalloxazine ring
  - C. A chromanol ring
  - D. A thiazole ring
2. Synthetic vitamin B12 is called:
  - A. Methylcobalamin
  - B. 5'-Deoxyadenosyl cobalamin
  - C. Cyanocobalamin
  - D. None of the above
3. RDA represents the:
  - A. Highest amount of a nutrient that appears safe for most healthy people.
  - B. Lowest amount of a nutrient that will maintain a specified criterion of adequacy.
  - C. Average amount of a nutrient considered adequate to meet the known nutrient needs of practically all healthy people in a population.
  - D. Average amount of a nutrient considered adequate to meet the known nutrient needs of half of all healthy people in a population
4. Which one of the following food groups would not be a good source of vitamin B12?
  - A. Dairy products
  - B. Green vegetables
  - C. Eggs
  - D. Meats

5. The release of glucose from glycogen stores in the liver and muscle requires which B-vitamin?
  - A. Pantothenic acid
  - B. Thiamin
  - C. Pyridoxine
  - D. None of the above
  
6. Tea is a major dietary source of which one of the following trace elements?
  - A. Manganese
  - B. Zinc
  - C. Copper
  - D. Selenium
  
7. Dietary iron bioavailability is increased by co-ingestion of:
  - A. Vitamin C
  - B. Vitamin D
  - C. Vitamin E
  - D. Dietary fibre
  
8. A deficiency of this vitamin often occurs on maize-based diets and is characterised by the '3 Ds' (diarrhoea, dermatitis and dementia). Which vitamin is it?
  - A. Vitamin B12
  - B. Folate
  - C. Vitamin C
  - D. Niacin
  
9. Vitamin C functions in which of the following processes?
  - A. Reduction of oxidised vitamin E
  - B. Synthesis of connective tissue
  - C. Synthesis of steroid hormones
  - D. All of the above
  
10. Which one of the following foods does not contain retinol?
  - A. Liver
  - B. Milk
  - C. Eggs
  - D. Carrots
  
11. Plasma calcium concentrations are increased by the action of which hormone?
  - A. Calcitonin
  - B. Thyroid hormone
  - C. Parathyroid hormone
  - D. None of the above
  
12. Which one of the following food groups would not be a good source of vitamin B12?
  - A. Dairy products
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  - D. Meats

13. Which of the following nutrients is good for wound healing?
- A. Selenium
  - B. Calcium
  - C. Zinc
  - D. Iron
14. Which vitamin deficiency disease may be found in severe alcoholism?
- A. Beriberi
  - B. Pellagra
  - C. Xerophthalmia
  - D. Rickets
15. Which mineral is essential for healthy red blood cells and its deficiency may cause anemia?
- A. Magnesium
  - B. Selenium
  - C. Iodine
  - D. Iron
16. Calcium bioavailability is reduced by:
- A. Dietary fibre
  - B. Oxalates
  - C. Phytic acid
  - D. All of the above
17. Which of the following are fat soluble vitamins?
- A. B, D & E
  - B. B, C & E
  - C. D, E & K
  - D. C, D & E
18. Absorption of vitamin B12 across the ileum is facilitated by which one of the following proteins?
- A. Haptocorrin
  - B. Transcobalamin
  - C. Intrinsic factor
  - D. None of the above
19. Which one of the following statements is incorrect?
- A. Goitrogens in foods decrease thyroid hormone synthesis
  - B. Iodine deficiency during pregnancy increases the risk of cretinism in newborn infants
  - C. Control of thyroid hormone synthesis is via the action of the adrenal glands
  - D. The major thyroid hormone in the blood is called thyroxine
20. Which of the following is not a consequence of vitamin A deficiency?
- A. Xerophthalmia
  - B. Keratomalacia
  - C. Bitot's spot
  - D. Osteomalacia

**SECTION B: SHORT ESSAY QUESTIONS [30 MARKS]**

1. Explain the following concepts terms [8 marks]
  - a) Spina bifida .
  - b) Ergocalciferol.
  - c) Osteoporosis.
  - d) Provitamin.
2. State four (4) factors that influence the bioavailability of minerals from food. [4 marks]
3. You are a nutritionist and are presented to with a patient with Pellagra. Highlight the foods you would prescribe for the patient. [2 marks]
4. Explain two (2) forms of beriberi that you are likely to encounter in a vitamin B1 deficiency area. [4 marks]
5. Highlight the functions of the following minerals in the human body. [4 marks]
  - i. Zinc
  - ii. Potassium
6. You are working in a referral hospital and a patient with the following symptoms is presented to you for nutrition counseling and guidance: irregular heartbeat, loss of appetite, muscle cramps and pain. Explain the deficiencies that the patient could be suffering from. [4 marks]
7. Vitamins are needed for the normal functioning of the body. List any four (4) characteristics of water-soluble vitamins. [4 marks]

**SECTION C: LONG ESSAY QUESTIONS [20 MARKS]**

1. Discuss the strategies that the government can employ to address the problem of micronutrient deficiencies in your country. [10 marks]
  2. You are expected to make a continuous medical education presentation on calcium. Highlight on the key points that need to be captured in the presentation in the following areas. Introduction, homeostasis, functions, deficiency and sources. [10 marks]
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