

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

SEMESTER TWO EXAMINATION FOR THE DEGREE
OF BACHELORS OF SCIENCE (BIOCHEMISTRY)

BIOC 215: BIOCHEMISTRY OF VITAMINS AND MINERALS

STREAMS: BIOC

TIME: 2 HOURS

DAY/DATE: MONDAY 15/4/2019

2.30 P.M. – 4.30 P.M.

INSTRUCTIONS

- Answer question **ONE (COMPULSORY)** and any other **TWO** questions.
- Sketch diagrams may be used whenever they may help to illustrate your answer.
- Do not write anything on the question paper.

QUESTION ONE (COMPULSORY) (30 MARKS)

- With use of a suitable diagram, demonstrate the interconversion of vitamin A metabolites (8 marks)
- With an aid of a suitable diagram, discuss the synthesis of coenzyme A from pantothenic acid (8 marks)
- Briefly discuss the physiologic role of sodium and potassium in human body (8 marks)
- Briefly discuss some factors that can influence the absorption of calcium in the human gastrointestinal tract (6 marks)

QUESTION TWO (20 MARKS)

- Draw the structure of biotin. With a use of suitable diagram demonstrate the importance of biotin in the conversion of pyruvate to oxaloacetate (8 marks)
- Mentioning some of the effects of zinc deficiency in human, enumerate some factors that can lead to deficiency of zinc in human (6 marks)
- Discuss the role of the mineral phosphorous in human body (6 marks)

QUESTION THREE (20 MARKS)

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- a. Demonstrate using a diagram the role of dietary nicotinic acid in the biosynthesis of NAD and NADP (8 marks)
- b. Illustrate the two major sources of magnesium in human diet (3 marks)
- c. Briefly explain fluorosis and explain some of the toxicological effects associated with fluorosis (5 marks)
- d. Zinc is important for activity of a number of enzymes. Mention some of the enzymes in which zinc play a key role for them to function well (3 marks)

QUESTION FOUR (20 MARKS)

- a. Giving examples, demonstrate how vitamins can be classified based on their solubility (3 marks)
 - b. Using a suitable diagram, demonstrate the conversion of provitamin D₂ and D₃ to D₂ and D₃ respectively. (7 marks)
 - c. With the use of a suitable diagram, illustrate the biosynthesis of the biologically active form of vitamin D (7 marks)
 - d. Briefly discuss Menke's syndrome to indicate the importance of minerals in human body. Mention the mineral associated with the above syndrome (3 marks)
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