CHUKA UNIVERSITY

UNIVERSITY EXAMINATIONS

SECOND YEAR EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE (BIOCHEMISTRY)

BIOC 205: BIOCHEMISTRY OF VITAMINS AND MINERALS

STREAMS: BSC BIOC Y2S2 **TIME: 2 HOURS**

DAY/DATE: WEDNESDAY 08/04/2020 **8.30 A.M. – 10.30 A.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.**
- **This is a closed book exam. No reference materials are allowed in the examination room.**
- **There will be No use of mobile phones or any other unauthorized materials.**
- **Write your answers legibly and use your time wisely.**

QUESTION ONE (30 MARKS) COMPULSORY

(a) Using a suitable diagram, illustrate the role of vitamin B_7 (biotin) CO_2 fixation reactions. (5 marks)

(b) Discuss the endocrine regulation of potassium homeostasis. (7 marks)

(c) With a use of suitable diagram, illustrate the Wald's visual cycle. (8 marks)

(d) Use the structure of vitamin E to demonstrate its antioxidant role in human body. (6 marks)

(e) List four metabolic effects of excess fluorine in human body. (4 marks)

QUESTION TWO (20 MARKS)

(a) Demonstrate the role of vitamin B_5 in biosynthesis of coenzyme A. (8 marks)

(b) Zinc is important for activity of a number of enzymes. Mention them. (3 marks)

(c) Briefly discuss the physiologic role of sodium and potassium in human body. (6 marks)

(d) Illustrate the two major sources of Magnesium in human diet. (3 marks)

QUESTION THREE (20 MARKS)

(a) Illustrate the conversion of $\beta -$ Carotene to retinol and retinoic acid. (8 marks)

(b) Briefly discuss some factors that can influence the absorption of calcium in the human gastrointestinal tract. (5 marks)

(c) Discuss the role of the mineral phosphorous in human body. (6 marks)

(d) List the classes of vitamin depending on their solubility. (1 mark)

QUESTION FOUR (20 MARKS)

(a) Demonstrate the conversion of ergosterol and 7 – dehydrocholesterol into their active forms. (6 marks)

(b) Mention some of the life processes in which vitamins are involved. (4 marks)

(c) Enumerate six causes of iron deficiency. (6 marks)

(d) Discuss the role of calcium in human body. (4 marks)
