CHUKA  **UNIVERSITY**

UNIVERSITY EXAMINATIONS

RESIT/SPECIAL EXAMINATION

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN BIOCHEMISTRY

BIOC 204: INTRODUCTION TO AMINO ACIDS AND PROTEINS

STREAMS: BSc BIOCHEMISTRY Y2S2 **TIME: 2 HOURS**

DAY/DATE: THURSDAY 26/07/2018 **8.30 A.M. – 10.30 A.M.**

INSTRUCTIONS:

- **Answer question one and any other two questions**
- **Do not write on the question paper**

Question One (30 marks)

a. Briefly describe secondary structure of proteins. (5 marks)

b. Which amino acids have carboxyl groups in their side chains? (2marks)

c. Briefly describe formation of a peptide bond (4 marks)

d. By the aid of diagrams, describe biosynthesis of serotonin. (5 marks)

e. Describe the general process of protein biosynthesis after formation of mRNA (5 marks)

f. Explain how hemoglobin releases oxygen in actively metabolizing tissues (5 marks)

g. Briefly describe cysteine as an amino acid that has an electrically neutral polar side chain (4 marks)

Question Two (20 marks)

a. Describe the major proteins of the muscle (11 marks)

b. Using appropriate structures, describe nonpolar amino acids (9 marks)

Question Three (20 marks)

a. Using structural illustrations, describe the ionization of histidine and calculate its pI value given that carboxyl group pKa is 1.82, imidazole side chain pKa is 6.0 and ammonium ion side chain pKa is 9.17. (12 marks)

b. Describe functions of some of non-protein amino acids (8 marks)

Question Four (20 marks)

a. Using illustrative diagrams, describe the structure and function of myoglobin (11 Marks)

b. Using illustrative diagrams, describe the process of chain initiation during prokaryotic protein synthesis (9 marks)
