CHUKA  **UNIVERSITY**

UNIVERSITY EXAMINATIONS

RESIT/SPECIAL EXAMINATION

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF BIOCHEMISTRY

BIOC 305: INDUSTRIAL BIOCHEMISTRY

STREAMS: BIOC **TIME: 2 HOURS**

DAY/DATE: MONDAY 24/07/2018 **2.30 P.M. – 4.30 P.M.**

INSTRUCTIONS:

- **Answer question ONE and any TWO questions.**
- **Do not write on the question paper.**

QUESTION ONE: 30 MARKS

(a) Describe production process and chemical composition of biogas. (7 marks)

(b) Outline microbial production of cheese. (7 marks)

(c) List and describe fundamental benefits of moderate alcohol consumption. (4 marks)

(d) Microbial cultures can be used to produce aroma compounds, either specifically for application as food additives or *in situ* as part of food fermentation processes. Using specific examples, discuss this statement. (7 marks)

(e) What is a bioreactor? List types of bioreactors used in bioprocess technology. (5 marks)

QUESTION TWO (20 MARKS)

(a) What are some of the pre-requisite for using microorganisms to manufacture a product? (3 marks)

(b) Distinguish between penicillin and cephalosporin antibiotics. (2 marks)

(c) Describe microbial production of β - lactam antibiotics. (10 marks)

(d) Artemisinin is a leading antimalarial today and is obtained from extracts of the Wormwood tree, *Artemisia annua*. Explain how genetically-engineered strain of *S. Cerevisiae have been used to improve production* of Artemisinin. (5 marks)

QUESTION THREE (20 MARKS)

(a) Define co-metabolism and explain why it is important for biodegradation? (10 marks)

(b) Explain the use of microbial enzymes in industry. (10 marks)

QUESTION FOUR (20 MARKS)

(a) Describe five (5) basic steps of brewing beer. (10 marks)

(b) Explain how monoclonal antibodies are produced and their uses. (10 marks)
