

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

**THIRD YEAR EXAMINATION FOR THE AWARD OF DEGREE OF
BACHELOR OF SCIENCE IN BIOCHEMISTRY**

BIOC 305: INDUSTRIAL BIOCHEMISTRY

STREAMS: BSC (BIOC)

TIME: 2 HOURS

DAY/DATE: TUESDAY 02/08/2016

11.30 AM – 1.30 PM

INSTRUCTIONS:

- **Answer Question One and any Two Questions**
- **Do not write on the question paper**

QUESTION ONE (30 MARKS)

- (a) Conventional sewage treatment is a controlled intensification of natural self-purification process.
- (i) Explain why it is important to treat sewage before disposal. [5 marks]
- (ii) Briefly describe four ways in which sewage treatment can be of economic importance to our society. [4 marks]
- (iii) Discuss the role of microorganism in sewage treatment process. [10 marks]
- (b) Outline microbial production of Yoghurt. [7 marks]
- (c) List and describe fundamental benefits of fermented milk in human body. [4 marks]

QUESTION TWO (20 MARKS)

- (a) Explain how microbial enzymes are used industrially. [10 marks]
- (b) Explain clearly the various techniques of enzyme immobilization. [10 marks]

QUESTION THREE (20 MARKS)

- (a) What are some of the pre-requisites for using microorganisms to manufacture a product? [2 marks]
- (b) Distinguish between penicillin and cephalosporin antibiotics. [4 marks]
- (c) Explain how penicillin G can be chemically modified to produce more potent penicillin derivatives. [4 marks]
- (d) Using structural and chemical formulae, describe the microbial biosyntheses of β -lactam antibiotics. [10 marks]

QUESTION FOUR (20 MARKS)

- (a) Explain how the normal food chain has been affected by various industrial contaminants. [5 marks]
 - (b) What is co-metabolism and why is it important for degradation processes? [4 marks]
 - (c) Describe the biodegradation process of halogenated pesticides and other xenobiotics. [7 marks]
 - (d) Explain how stereochemistry affects biodegradation of a given compound. [4 marks]
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