

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

**EXAMINATION FOR THE AWARD OF DEGREE OF
BACHELOR OF EDUCATION SCIENCE, BACHELOR OF SCIENCE
BIOCHEMISTRY**

BOTA 436: INDUSTRIAL MICROBIOLOGY

STREAMS: BED (SCI), BSC (BIO)

TIME: 2 HOURS

DAY/DATE: THURSDAY 11/04/2019

11.30 AM – 1.30 PM

INSTRUCTIONS:

ANSWER ALL QUESTIONS IN SECTION A AND TWO IN SECTION B

SECTION A (30 MARKS) – ANSWER ALL QUESTIONS IN THIS SECTION

1. (a) Describe three criteria used to assess risk in aseptic operation and containment of Fermenter as explained by Collins in 1992. [3 marks]
- (b) State two conditions necessary for industrial fermentation of enzyme invertase. [2 marks]
2. (a) Explain three actions applied in prevention of aflatoxicosis caused by consumption of aflatoxins. [3 marks]
- (b) Describe two processes by which citric acid can be industrially produced. [2 marks]
3. (a) Describe three methods of maintenance and preservation of pure cultures. [3 marks]
- (b) Explain the cause and transmission of enteric fever. [2 marks]
4. (a) Highlight the steps involved in steroids biotransformation. [3 marks]

- (b) Differentiate between batch fermentation and continuous fermentation. [2 marks]
5. (a) Describe three causes of food spoilage [3 marks]
- (b) Name one microbial species involved in industrial production of the following enzymes
- (i) Protease [1 mark]
- (ii) Invertase [1 mark]
6. (a) Describe three main factors that contribute to occurrence of foodborne diseases. [3 marks]
- (b) Name the scientist who contributed to the following in the industrial microbiology;
- (i) Pioneered production of monoclonal antibodies [1 mark]
- (ii) Developed the first novel industrial scale fermentation process (acetone-butanol fermentation) [1 mark]

SECTION B – (40 MARKS) – ANSWER TWO QUESTIONS ONLY IN THIS SECTION

7. Explain various methods used in food preservations. [20 marks]
8. (a) Discuss intrinsic parameters which influence microbial growth of microorganisms in food. [10 marks]
- (b) Explain five types of phytoremediation techniques classified based on the contaminant fate. [10 marks]
9. (a) Discuss steps employed for the recovery of the product(s) obtained after downstream processing (DSP) during industrial fermentation process. [10 marks]
- (b) Explain five major steps involved in commercial production of wines. [10 marks]
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