

**CHUKA**



**UNIVERSITY**

**UNIVERSITY EXAMINATIONS**

**EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE**

**BOTA 436: INDUSTRIAL MICROBIOLOGY**

**STREAMS:**

**TIME: 2 HOURS**

**DAY/DATE: FRIDAY 24/09/2021**

**8.30 A.M – 10.30 A.M**

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**INSTRUCTIONS**

- Answer all questions in section A and any two in section B**
- Do not write anything in this question paper**
- Use illustrations where appropriate to enhance your answer**

**Section A (30 marks)**

1. Define the following terms as used in industrial microbiology. [3 marks]
  - (a) Bioremediation
  - (b) Antimycotics
  - (c) Methanogenesis
2. Outline the disadvantages of continuous culture method in the application of microorganism in industries. [4 marks]
3. Describe extraction process for penicillin after fermentation. [5 marks]
4. Outline five characteristics of single cell proteins that are used in industrial processes. [5 marks]

5. A milk fermentation company would like to preserve their microorganism for a longer period of time while in suspended metabolic state. Discuss suitable methods for this type of preservation. [4 marks]
6. (a) Describe the properties of industrial enzymes from bacteria. [5 marks]
- (b) Highlight key microorganisms applied in industries indicating their role in production. [4 marks]

**SECTION B (40 MARKS)**

7. (a) Discuss various factors that are considered while designing a bioreactor for fermentation process. [10 marks]
- (b) Discuss characteristics of an ideal microorganism for industrial use. [10 marks]
8. (a) Design an experiment on how to manufacture alcohol in the laboratory using fermentation. [10 marks]
- (b) Explain why antifoam agents are required in fermentation process. [10 marks]
9. Discuss batch cultures and their suitability in fermentation. [20 marks]
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