CHUKA  **UNIVERSITY**

UNIVERSITY EXAMINATIONS

FIRST YEAR EXAMINATION FOR THE AWARD OF BACHELOR DEGREE IN

BOTA 102: FUNDAMENTALS OF MICROBIOLOGY AND BIOTECHNOLOGY

STREAMS:

TIME: 2 HOURS

DAY/DATE: MONDAY 14/12/2020 **11.30 A.M -1.30 P.M.**

INSTRUCTIONS:
- Answer All questions in section A and any two in section B
- Do not write anything on the question paper
- Use illustrations where appropriate to enhance your answer.

SECTION A (30 MARKS)

1. Define the following terms [5 Marks]

i. Bioreactor
ii. Bioremediation
iii. Trade marks
iv. Recombinant DNA
v. Fermentation

2. Describe Koch's postulates. [5 Marks]

3. a) State three methods that are used to detect the presence of microorganisms. [3 Marks]
b) Give reason why Gram +ve bacteria retain the purple crystal violet stain during the gram stain. [2 Marks]

4. Discuss ethical considerations in biotechnology and microbiology. [5 Marks]

5. Discuss the risk of using genetically modified organisms. [5 Marks]

6. Using diagrams, describe the structure and functions of plasma membrane in a eukaryotic cell.

SECTION B (40 MARKS)

7.a. Define biosensor and describe different types of biosensors. [8 Marks]

b. Describe key features that an effective biosensor must possess. [12 Marks]

8. Discuss the applications of biotechnology in agriculture. [20 Marks]

9. Discuss roles of microorganism in industries. [20 Marks]

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