BINDURA UNIVERSITY OF SCIENCE EDUCATION

BIOLOGICAL SCIENCES DEPARTMENT

BScBZH

ENVIRONMENTAL MICROBIOLOGY (BZM402)

EXAMINATION

2 HOURS (100 MARKS)

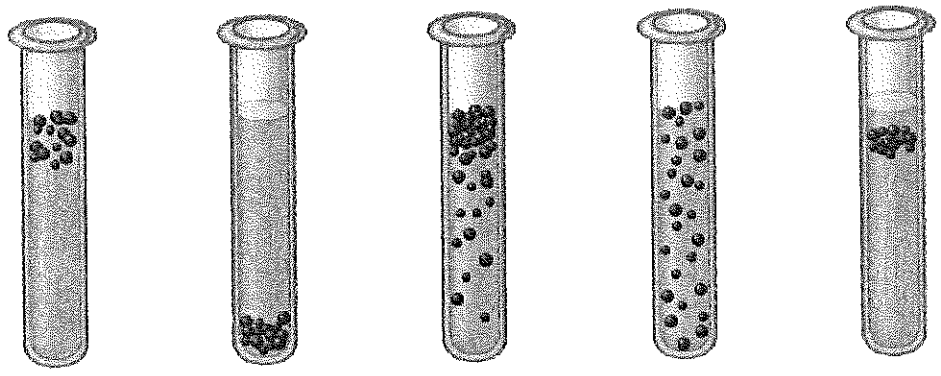
OCT 2024

INSTRUCTIONS TO CANDIDATES

Answer FOUR questions. You MUST answer QUESTION 1 (Section A) and any THREE questions from section B. Each question carries 25 MARKS. Where a question contains sub-divisions, the mark value of each sub-division is given in brackets. Illustrate your answer where appropriate with large clearly labelled diagrams. You should not spend more than thirty minutes on each question.

SECTION A (COMPULSORY)

Q1. Four tubes are illustrated showing bacterial cell distribution in thioglycolate nutrient broth tubes.



A B C D E

(a) Describe how the different thioglycolate nutrient broth tubes were prepared. (5 marks)

(b) Match the culture tube with the correct type of bacteria in terms of its oxygen requirements. (5marks)

(c) Describe culture dependent and culture-independent techniques of analyzing microbial diversity in natural environments. (15 marks)

SECTION B

2. (a)Discuss infectious diseases transmitted by water and food products. (10 marks)

(b)Suggest strategies that should be adopted to minimize the occurrence of food and water-borne diseases in Zimbabwe. (15 marks)

3. Write short notes on any FIVE of the following:

(a)Acidophiles) (5 marks)

(b)Molecular chronometers (5 marks)

(c)Biofilm formation (5 marks)

(d)Biological oxygen demand (BOD) (5 marks)

(e)Quorum sensing (5 marks)

(f)Biosecurity (5 marks)

4. Outline the process of wastewater treatment which is followed in most large cities.

5. Discuss the various types of microbial interactions.

6. Describe the bacterial toxins and mycotoxins and their mechanisms of action.

END OF EXAMINATION QUESTION PAPER