BINDURA UNIVERSITY OF SCIENCE EDUCATION
BIOLOGICAL SCIENCES DEPARTMENT
BACHELOR OF SCIENCE HONOURS DEGREE IN BIOLOGICAL SCIENCES(BScBZH)
APPLIED BACTERIOLOGY & MYCOLOGY (BZH 210)

EXAMINATION

2 HOURS (100 marks)

INSTRUCTIONS
Answer FOUR questions. You must answer question 1(Section A) and any other THREE questions from Section B. Each question carries 25 marks. Where a question contains subdivisions, the mark value of each subdivision is given in brackets. Illustrate your answer where appropriate with large clearly diagrams. You should not spend more than 30minutes on each question.

SECTION A (COMPULSORY)

1.(a) Milk is routinely tested for the presence and number of bacteria present before it can be processed. A microbiologist measured the bacterial population of a sample of milk from a bulk tank. A serial dilution of the milk was made and 0.1 cm^3 of each dilution plated onto a nutrient agar plate. After 24 hours, the numbers of colonies of bacteria are counted. Table 1 shows the results.

Table 1

dilution	undiluted	10^{-1}	10^{-2}	10^{-3}	10^{-4}	10^{-5}
Number of colonies	Too many colonies to count			402	75	12

(i) Describe how serial dilution is made. (3marks)
(ii) State the dilutions that might be used to estimate the number of bacteria in the milk and explain the reasons for your choice. (3 marks)
(iii) Using the dilution, you have chosen in (ii), calculate the number of bacterial cells per cm^3 in the milk sample. Show your working. (3 marks)

(b) Pathogenic bacteria like *Salmonella* may contaminate milk. State any TWO possible origins of *Salmonella* in milk. (2 marks)

(c) Describe the process of pasteurizing milk. (2 marks)

(d) Explain the importance of differential, selective and defined media in the culturing of microorganisms. (12 marks)

SECTION B

2. Write short notes on any FIVE of the following:
(a) *Rhizobium* (5 marks)
(b) Mycotoxins (5 marks)
(c) Bioremediation (5 marks)
(d) Hyphae (5 marks)
(e) Acid fast stain (5 marks)
(f) Facultative anaerobe (5 marks)

3. (a) Describe extrinsic factors that influence food spoilage and how they exert their effects. (13 marks)

(b) Describe the role of yeasts in fermentation processes. (12 marks)

4. Discuss the medical and agricultural importance of fungi.

5. Describe the industrial production of yoghurt, naming the species most commonly used as starter cultures.

6. Describe any **THREE** in-situ bioremediation techniques.

END OF EXAMINATION QUESTION PAPER