UNAM
UNIVERSITY OF NAMIBIA

FACULTY	AGRICULTURE, ENGINEERING AND NATURAL SCIENCES		
SCHOOL	AGRICULTURE AND FISHERIES SCIENCES		
DEPARTMENT	FOOD SCIENCE AND SYSTEMS		
SUBJECT	GENERAL MICROBIOLOGY		
SUBJECT CODE	F3611SG		
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DURATION	3 HOURS	**MARKS**	100

SECOND OPPORTUNITY EXAMINATION

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This question paper consists of **three (3)** page excluding this front page.

Instructions

- **Answer all five (5) questions**
- **Calculators are allowed.**

QUESTION 1

a) Define is taxonomy, briefly describe this term and list the three main domains of life. **[4]**

b) What is the difference between spontaneous generation and biosis (biogenesis)? Explain with examples. **[6]**

c) Bacteria exist in different shapes (morphology) and sizes. Outline the four major shapes of bacteria. **[4]**

d) All organisms need energy in order to survive. What are the three (3) ways which most bacteria use to get energy? **[6]**

QUESTION 2

a) Define the term symbiosis and list four (4) major chemical elements commonly involved in the biogeochemical cycle. **[5]**

b) Describe two (2) examples (one each) of symbiotic relationships between bacteria and humans, and ruminant animals, and explain how both the bacteria and the host benefit from these relationships. **[6]**

c) Describe the three (3) ways which organisms get energy in a food web. **[9]**

QUESTION 3

a) Briefly differentiate between sterilization and commercial sterilization in terms of microbial control. **[4]**

b) Heat is one of the most commonly used physical methods for controlling microbial growth.

i) Explain how heat kills or inactivates microorganisms. **[2]**

ii) Describe two moist heat methods used in microbial control, including their typical conditions and effectiveness. **[6]**

c) Explain any four (4) different factors that may influence how microbial growth can be controlled? **[8]**

QUESTION 4

a) What are the key properties/characteristics of a good useful industrial microorganism? **[8]**

b) Briefly explain the difference between probiotics and antibiotics and highlight the effect probiotic may have in human health. **[6]**

c) Name and briefly explain some benefits of food fermentation. **[6]**

QUESTION 5

a) A bacterial culture begins with 1×10^8 viable cells. A disinfectant is applied that reduces the population by 99% every minute (this corresponds to a 2 Log reduction per minute). Calculate the number of viable cells remaining after 1 minute, 2 minutes, and 3 minutes. **[6]**

b) What are antibiotics and why are they important in controlling microbial growth? Give at least one example of antibiotic produced by fungi and by bacteria. **[6]**

c) Highlight four (4) specific applications of Recombinant DNA technology in industrial microbiology. **[8]**

-END OF EXAMINATION-