



**NAMIBIA UNIVERSITY  
OF SCIENCE AND TECHNOLOGY**

**FACULTY OF HEALTH AND APPLIED SCIENCES**

**DEPARTMENT OF NATURAL AND APPLIED SCIENCES**

<b>QUALIFICATION:</b> BACHELOR OF SCIENCE	
<b>QUALIFICATION CODE:</b> 07BOSC	<b>LEVEL:</b> 7
<b>COURSE CODE:</b> MIB701S	<b>COURSE NAME:</b> MICROBIOLOGY
<b>SESSION:</b> JUNE 2019	<b>PAPER:</b> THEORY
<b>DURATION:</b> 3 HOURS	<b>MARKS:</b> 100

<b>FIRST OPPORTUNITY EXAMINATION QUESTION PAPER</b>	
<b>EXAMINER(S)</b>	MR. MUNYARADZI ZIVUKU
<b>MODERATOR:</b>	DR. RONNIE ANTHONY BOCK

<b>INSTRUCTIONS</b>	
<ol style="list-style-type: none"><li>1. There are FIVE questions on this paper. Answer ALL the questions.</li><li>2. The number of marks are given in brackets ( ) at the end of each question or part question.</li><li>3. Write clearly and neatly.</li><li>4. Number the answers clearly.</li></ol>	

**PERMISSIBLE MATERIALS**

NONE

**THIS QUESTION PAPER CONSISTS OF 3 PAGES (Including this front page)**

## **SECTION A (40 MARKS)**

### **QUESTION 1**

**(20)**

- 1.1 Several theories have been postulated to try and explain whether an HIV virus is a living entity or not. From what you have studied, briefly discuss whether the HIV virus is a living or non-living? Give reasons to justify your answer. (4)
- 1.2 Discuss, why in the early 1860s, scientist erroneously placed bacteria and fungi under the Kingdom Plantae. (4)
- 1.3 At some point in the development of microbiology, there was a challenge of linking the causative agent of the disease to the disease itself. Briefly outline the various lines of proof used by Robert Koch to link the pathogen and the disease. (12)

### **QUESTION 2**

**(20)**

- 2.1 Figure 2.1 represents a bacteria growth curve of *E. coli* in MacConkey broth. Study the diagram and answer the question that follows;

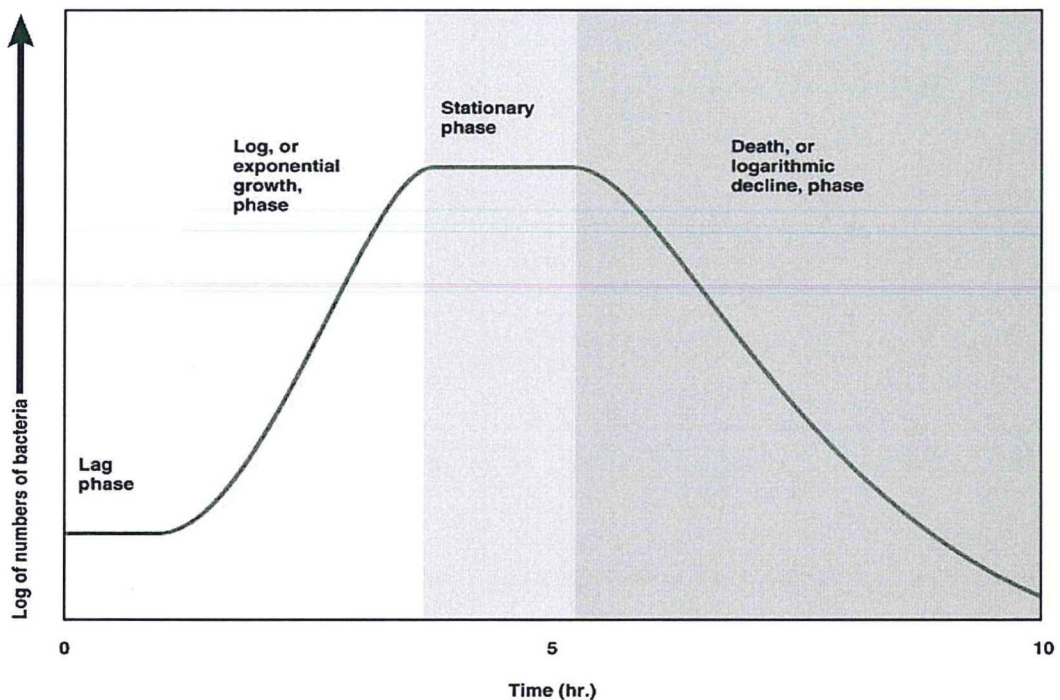


Figure 2.1: The growth curve of *E. coli* growing in MacConkey broth.

Briefly, describe the main stages of bacteria growth curve.

**(8)**

- 2.2 Distinguish between endotoxins and exotoxins. (3)
- 2.3 Evaluate the use of positive and negative staining techniques in the identification and classification of bacteria. (9)

## **SECTION B (60 MARKS)**

### **QUESTION 3 (20)**

- 3.1 Discuss FIVE methods of maintenance and preservation of pure cultures. (10)
- 3.2 Briefly describe the characteristics of *Salmonellae* and devise a simple laboratory method you can use to isolate and identify it. (10)

### **QUESTION 4 (20)**

- 4.1 Briefly describe four factors influencing the effectiveness of antimicrobial treatment. (8)
- 4.2 Physical methods such as application of heat to microbial population is not always effective in the control of the growth and spread of microorganism. Evaluate the use and effectiveness of various heat treatment methods in controlling the spread and growth of microorganisms. (12)

### **QUESTION 5 (20)**

- 5.1 Define the term indicator microorganisms and their significance as diagnostic tools in municipal water testing. (3)
- 5.2 Explain why it is advisable to monitor BOD before discharging raw sewage into rivers. (3)
- 5.3 Describe how *Bacillus thuringiensis* or its toxin is used as a pesticide in agriculture. (6)
- 5.4 Describe the role of lactic acid bacteria in the manufacture of fermented milk products such as cultured milk. (8)

**END OF QUESTION PAPER**