NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH AND APPLIED SCIENCES

DEPARTMENT OF NATURAL AND APPLIED SCIENCES

QUALIFICATION: BACHELOR OF SCIENCES HONOURS	
QUALIFICATION CODE: 08BOSC	**LEVEL:** 8
COURSE CODE: AMB821S	**COURSE NAME:** ADVANCED MICROBIOLOGY
SESSION:JANUARY 2018	**PAPER:** THEORY
DURATION: 3 HOURS	**MARKS:** 100

SUPLEMENTARY/SECOND OPPORTUNITY EXAMINATION QUESTON PAPER	
EXAMINER	MR MUNYARADZI ZIVUKU
MODERATOR:	DR. RONNIE ANTHONY BOCK

INSTRUCTIONS
1. Answer ALL the questions. 2. Write clearly and neatly. 3. Number the answers clearly. 4. Answer each question in a separate sheet of paper 5. All written work **MUST** be done in **BLUE** or **BLACK** ink.

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

SECTION A (40 MARKS)

QUESTION 1 (20)

1. In 1872, Frans Schrandinger proposed that *E.coli* could be use to indicate that water is contaminated with feces.

1.1.1 Briefly outline the main reason why e. coli was chosen as a test microorganism for the presence of contaminants in feces. (3)

1.1.2 Propose a method that could be used for the isolation and enumeration of coliforms from contaminated water. (4)

1.1.3 Testing for coliforms is sometimes accompanied by biochemical test such as IMViC. What does is the principle underlying the IMViC test in microorganisms? (7)

1.2 Discuss how protoplast fusion has been used to manipulate microorganism genetically for industrial use. (6)

QUESTION 2 (20)

2.1 Jane is fourth year B.Sc Honours student and she did an experiment to analyses the microbial load of water samples using the Most Probable Number (MPN) method in the laboratory. Jane used the MPN table (illustrated in table 1) to enumerate the number of microorganisms. In her attempt, she got a value of MPN of 9.2 per 100 ml.

Table1: Table of the most Probable Number (MPN) per 100ml of sampling using three tubes of each dilution

Number of positive tubes in dilutions			
10 ml	**1 ml**	**0.1 ml**	**MPN per 100 ml**
0	0	0	
0	1	0	3
0	0	3	6
0	1	0	3
0	1	1	6.1
0	1	2	9.2
0	1	3	12

2.1.1 Briefly describe the procedure of MPN that she used to arrive at a value of 9.2 per 100 ml. (8)

2.1.2 What are the disadvantages of MPN method as a diagnostic tool in microbiological samples. (3)

2.2 Outline the principle of protein evolution as applied in industrial microbiology. (9)

SECTION B (60 MARKS)

QUESTION 3 (20)

3.1 Differentiate between transcriptomes and proteomes. (4)

3.2 Explain the importance of measurements of gene expressions. (6)

3.3 Discuss how infectious diseases such Ebola virus can be prevented and controlled. (10)

QUESTION 4 (20)

4.1 Briefly describe three factors for the control and optimization of a bioremediation process. (6)

4.2 For a chosen bioremediation, describe how pollution gets into the environment. (3)

4.3 Briefly define the term coliforms and their role in the diagnostics of waste water treatment. (5)

4.4 Briefly describe how microorganisms can be used in the Recovery of low grade ores (6)

QUESTION 5 (20)

5.1 Briefly explain the conditions necessary for a pathogen to cause disease. (4)

5.2 The occurrence of plasmids in microorganism is a necessary evil. Discuss the statement? (5)

5.3 Outline the pathogenic properties of virus. (5)

5.4 Give an account of the application of amylases enzymes in food industries. (5)

END OF QUESTION PAPER