



**NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

FACULTY OF HEALTH AND APPLIED SCIENCES

DEPARTMENT OF NATURAL AND APPLIED SCIENCES

QUALIFICATION: BACHELOR OF SCIENCE	
QUALIFICATION CODE: 07BOSC	LEVEL: 7
COURSE CODE: MIB701S	COURSE NAME: MICROBIOLOGY
SESSION: JULY 2019	PAPER: THEORY
DURATION: 3 HOURS	MARKS: 100

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

PERMISSIBLE MATERIALS

NONE

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

SECTION A (40 MARKS)

QUESTION 1 (20)

- 1.1 Distinguish between Gram-positive and Gram-negative cell walls. (4)
- 1.2 "Bacteria shows a great deal of diversity in their nutritional patterns". Discuss this statement. (16)

QUESTION 2 (20)

- 2.1 Differentiate between selective media and differential media. (3)
- 2.2 The table below shows the composition of Mannitol Salt Agar (MSA) which is used as both and selective and differential media.

Composition of Mannitol Salt agar	
Typical formula	Concentrations (g/l)
Beef Extract	1.0
Peptospecial	10.0
Sodium Chloride	75.0
Mannitol	10.0
Phenol red	0.025
Agar	15.0
pH = 7.4 at 25°C	

Figure 1.0: Composition of Mannitol Salt Agar (MSA)

- 2.2.1 Briefly describe the role of the ingredients in MSA. (4)
- 2.2.2 Discuss how MSA is able to select and differentiate microbial populations. (3)
- 2.3 Briefly discuss the viable plate count method for the enumeration of bacteria. (10)

SECTION B (60 MARKS)

QUESTION 3 (20)

- 3.1 What is a pure culture? (2)
- 3.2 Imagine you are working as a Junior microbiologist in a new research institute laboratory. Your supervisor asks you to isolate a pure culture from soil. Briefly describe how you can isolate a pure culture from soil. (9)

- 3.3 Suppose the pure culture you isolate from 3.2 is resistant to an antibiotic such as penicillin. Detail how you would determine whether your pure culture is resistant to penicillin or not? (9)

QUESTION 4 (20)

- 4.1 Briefly discuss how the following factors influences microbial death.
- 4.1.1 Time of exposure. (2)
- 4.1.2 Environmental factors. (3)
- 4.1.3 Number and type of microorganism present. (4)
- 4.2 Write brief notes on *Clostridium botulinum* as a pathogen. (11)

QUESTION 5 (20)

- 5.1 Give an account of how microorganisms are used for the extraction of low grade ores. (10)
- 5.2 Discuss the role of microorganism in sewage and water treatment. (10)

END OF QUESTION PAPER