



**NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

FACULTY OF HEALTH, NATURAL RESOURCES AND APPLIED SCIENCES

SCHOOL OF NATURAL AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGY, CHEMISTRY AND PHYSICS

QUALIFICATION : BACHELOR OF SCIENCE (HONOURS)	
QUALIFICATION CODE: 08BOSC	LEVEL: 8
COURSE CODE: MSP811S	COURSE NAME: MICROBIAL SYSTEMATICS AND PROCESSES
SESSION: JUNE 2023	PAPER: THEORY
DURATION: 3 HOURS	MARKS: 120

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
EXAMINER(S)	Prof Percy Chimwamurombe
MODERATOR:	Dr Jean-Damascene Uzabakiriho

INSTRUCTIONS	
<ol style="list-style-type: none">1. Answer ALL the questions.2. Write clearly and neatly.3. Number the answers clearly.	

PERMISSIBLE MATERIALS

Non-programmable Calculators

ATTACHMENTS

None

THIS QUESTION PAPER CONSISTS OF 2 PAGES (Including this front page)

Section A:**[60 marks]**

1. Why is Carl Woese an important figure in microbial classification and taxonomy? (5 marks)
2. What is the GC content of the molecule below? (5 marks)

-CAAAAAGAAAAAAGCCAACCAAGGGCAAAAACGGCCACGA-

3. Explain why the presence of many *Archaea* has only been confirmed by community sampling of rRNA genes and not by culture in the laboratory. (5 marks)
4. When a new organism is described, certain procedures take place before its name and description become "official." Explain this process. (5 marks)
5. Explain the defining features of Enteric bacteria. (5 marks)
6. Explain how *Wolbachia* and *Bacillus thuringiensis* might be used as natural insecticides against arthropods and insects, respectively. (5 marks)
7. Why does *Archaeoglobus* represent a metabolically transitional type of organism that bridged the energy generating processes of S production and methanogenesis? (5 marks)
8. Compare and contrast *Pyrodictium* and *Pyrolobus*. (5 marks)
9. Explain why *Nanoarchaeum* is classified as a cell rather than a non-cell. (5 marks)
10. Where is the thermosome found and what is its apparent role? (5 marks)
11. Speculate on the possibility of life on other planets. (5 marks)
12. Why can multiple phylogenetic probes be used on a single sample? (5 marks)

Section B (Essays):**[60 marks]**

1. "We only know about 5-10% of the bacteria out there". Comment on this statement in an essay highlighting the technological challenges in generating data to name new bacteria microbes. (30 marks)
2. Describe the diversity in the Proteobacteria. (30 marks)