



GWANDA STATE UNIVERSITY

Excellence through Esprit De Corps...

FACULTY OF LIFE SCIENCES.

BSc HONOURS ANIMAL SCIENCE DEGREE

LAS 1104 AGRICULTURAL MICROBIOLOGY

FIRST SEMESTER EXAMINATION PAPER

NOVEMBER 2019. Block

This examination paper consists of 3 pages.

Time Allowed: 3 hours
Total Marks: 100
Special Requirements: N/A
Examiner's Name: Mr Dlamini D

INSTRUCTIONS.

1. Answer **All** questions in Section A.
2. Answer any **THREE** Questions in Section B. Each question in this section will carry 20 marks.
3. Do not open question paper until told to do so.

MARK ALLOCATION

QUESTION	MARKS
SECTION A	40
SECTION B	60
TOTAL ATTAINABLE MARKS	100

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Section A: ANSWER ALL QUESTIONS

1. Define the following:
 - a. Facultative Anaerobic bacteria. [1]
 - b. Flagellum. [1]
 - c. Cristae. [1]
 - d. Mycelium. [1]
 - e. Fermentation [1]

2. Distinguish between the following:
 - a. Sterilization and disinfection. [2]
 - b. Arbuscular mycorrhizae and rhizobacteria. [2]
 - c. Transmission electron microscope and scanning electron microscope. [2]
 - d. Micrometre and nanometre [2]
 - e. Budding and binary fission [2]
 - f. Selective and enrichment media [2]

3. State if the following statements are TRUE or FALSE.
 - a. The scientist responsible for postulating the methods of microorganism isolation was Louis Pasteur. [1]
 - b. The classification of bacterial organisms is based primarily on morphology and nucleic acid composition and structure. [1]
 - c. The bacterial cell cycle is operative only during the log phase of the growth curve. [1]
 - d. The attachment of a virus to a specific host involves the interaction of attachment site(s) on the virus surface, and receptor site(s) on the cell surface. [1]
 - e. In relation to size bacteria are the biggest followed by fungi, protozoa and lastly viruses. [1]

4. Describe the process of sporulation in bacterial organisms with the aid of a diagram. [8]

5. Highlight the beneficial interactions between microorganisms, plants and animals that are of significance to agriculture. [12]

TOTAL MARKS = 42

Section B. Answer any **THREE** questions

Question 6

Highlight the difference[s] between sterilization and disinfection. Discuss some of the methods used in sterilization and disinfection using suitable examples. [20]

Question 7

- a. Using Specific examples describe the different morphological forms of bacteria. [13]
- b. Explore the significance of the innovations by Robert Koch and Luis Pasteur on the evolution of modern microbiology. [7]

Question 8

- a. Describe the role of microbes in the decomposition of the following compounds in the soil.
 - i. Cellulose [3]
 - ii. Hemicellulose [2]
 - iii. Lignin [3]
- b. Explain the role of microbes in each of the following processes
 - i. Biological control of pests and diseases [4]
 - ii. Bioremediation [4]
 - iii. Bio fertilisation [4]

Question 9

- a. Diagram a Gram-positive and Gram-negative bacterial cell wall. [6]
- b. Explain the differences in the chemical structure of these two types of bacterial cell walls. [4]
- c. Where and when does penicillin affect bacterial cells? [2]
- d. Describe the general life cycle of a fungal organism [8]