

GWANDA STATE UNIVERSITY



FACULTY OF NATURAL RESOURCES MANAGEMENT AND AGRICULTURE

DEPARTMENT OF HORTICULTURE AND CROP PRODUCTION

**BACHELOR OF SCIENCE HONOURS DEGREE IN HORTICULTURE AND CROP
PRODUCTION / ANIMAL PRODUCTION AND HEALTH**

NHC1106/NAP1102 INTRODUCTION TO MICROBIOLOGY

MAIN Examination Paper

December 2024

This examination paper consists of Three pages.

Time Allowed: Three (3) Hours

Total Marks: 100

Special Requirements: None

Examiner's Name: Ms N Mbiza

INSTRUCTIONS

- a) Answer **ALL** questions in Section A
- b) Answer **THREE (3)** questions in Section B

MARK ALLOCATION

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

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Section A: ANSWER ALL QUESTION IN SECTION A

Question 1

Describe the decomposition of some of the major constituents of soil organic matter/plant residues under the following headings:

- (i) Cellulose decomposition [5]
- (ii) Hemicellulose decomposition [5]
- (iii) Chitin decomposition [5]
- (iv) Lignin decomposition. [5]

Question 2

- a) _____ is the process in which there is movement of certain genes from one DNA molecule to another. [1]
- b) The process in which cell-free DNA is taken up by a cell and engages in genetic recombination is called _____. [1]
- c) An enzyme _____ the activation energy required for a chemical reaction [1]
- d) Members of the same species that possess different characteristics are called _____. [1]
- e) The method for screening antibiotic producing microorganisms is called _ [1]

Question 3

a) Elaborate on the following terms in one sentence:

- i. Humic acid
- ii. Mesophiles
- iii. Herbicide
- iv. Biogas
- v. Vermiculture [5]

b. 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]

SECTION B. ANSWER THREE QUESTIONS IN SECTION B

Question 4

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

Question 5

- a. Explain the morphological features of protozoa [14]
- b. Explain three ways that fungi are like animals. [6]

Question 6

- a. Explain **THREE** factors affecting the growth of bacteria. [6]
- b. Describe three ways in which fungi function as mutualistic symbiont's and what benefit the fungi, and the other organism receive from the partnership. [14]

Question 7

- a. Using appropriate examples, explain spore formation in bacterial cells [10]
- b. Explore the significance of the innovations by Robert Koch and Luis Pasteur on the evolution of modern microbiology. [6]
- c. List **FOUR** microorganisms that are used in the production of named foods. [4]

END OF EXAMINATION PAPER