



UNIVERSITY EXAMINATIONS

SECOND SEMESTER 2023/2024 ACADEMIC YEAR

**THIRD YEAR EXAMINATION FOR THE DEGREE OF
BACHELOR OF SCIENCE (GENERAL)**

BOTA 321: ADVANCED MICROBIOLOGY

STREAM: R

TIME: 2 HRS

DAY: FRIDAY [2.30P.M – 4.30P.M]

DATE: 12/04/2024

THIS QUESTION PAPER CONSISTS OF THREE (3) PAGES

PLEASE DO NOT OPEN UNTIL THE INVIGILATOR SAYS SO.

INSTRUCTION: Answer **All** Questions in Section A, and only **TWO** questions in Section B
SECTION A (40 MARKS)

QUESTION ONE

Using Alanine as your amino acid of choice:

- i) Deduce structurally the chemical process that yields protein for bacterial utility (4 Marks)
- ii) Using illustrations, describe how peptide bonds formed. (5 Marks)

QUESTION TWO

Using an appropriate example, explain the interaction between fungi and the human immune system. (4 Marks)

QUESTION THREE

With specific examples, distinguish between True pathogens and Opportunistic pathogens. (4 Marks)

QUESTION FOUR

Briefly discuss **FOUR** ecological associations that exist among microorganisms. (4 Marks)

QUESTION FIVE

Describe the chemical process of Nitrogen metabolism in bacteria and its biosynthetic roles. (5 Marks)

QUESTION SIX

Distinguish between Bioremediation and Bio-augmentation (2 Marks)

QUESTION SEVEN

Demonstrate with an illustration bacterial growth in a batch culture. (5 Marks)

QUESTION EIGHT

- a) State **THREE** factors that influence the presence of urogenital flora.
- b) Name one common fungal flora. (4 Marks)
- c) Outline the different sources of the following nutritional elements in microorganisms.
 - i. Sulfur
 - ii. Phosphorus
 - iii. Nitrogen (3 Marks)



SECTION B (30 MARKS)

QUESTION NINE

Discuss the various methods used in control of Microorganisms. **(15 Marks)**

QUESTION TEN

Using examples of bacteria, fungi, viruses and protozoans, explain the occurrence of microorganisms in the air, highlighting their significance and detrimental effects **(15 Marks)**

QUESTION ELEVEN

Discuss the mechanisms of **adhesion** and **establishment** in Microorganisms. **(15 Marks)**

