



# MACHAKOS UNIVERSITY

University Examinations 2018/2019

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FIRST YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE IN POPULATION HEALTH

HEH 104 BASICS IN ENVIRONMENTAL MICROBIOLOGY

DATE: 29/7/2019

TIME: 2.00-4.00 PM

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## INSTRUCTIONS

1. Answer Question 1 (compulsory) and **any two** questions in Section B.
2. Use clean well labelled diagrams wherever appropriate.

## SECTION A

### QUESTION ONE

- a) Distinguish between prokaryotes and Eukaryotes (4 marks)
- b) Differentiate between bacteria and virus (3 marks)
- c) Describe 4 methods of sterilization (6 marks)
- d) Using specific examples outline the four sub-divisions of protozoa (4 marks)
- e) Outline 4 types of microscope and the importance of each in the study of microorganisms (4 marks)
- f) Describe three characteristics of fungi (3 marks)
- g) Briefly discuss the Replication cycle of viruses (6 marks)

## SECTION B

### QUESTION TWO

- a) With aid of a diagram, Explain the bacterial growth curve and activities involved in each phase (12 marks)
- b) Describe four (4) factors affecting microbial growth (8 marks)

### **QUESTION THREE**

Discuss the application of Microbiology in:

- a) Medical, pharmaceutical and Biotechnology (12 marks)
- b) Food production (8 marks)

### **QUESTION FOUR**

- a) Using relevant examples discuss 4 (four) types of symbiotic Associations (10 marks)
- b) Discuss mechanisms which enhance the virulence of pathogens (10 marks)

### **QUESTION FIVE**

The field of microbiology has evolved over time based on the major contributions by a number of scientists. Describe the role of the following;

- a) Robert Koch (4 marks)
- b) Louis Pasteur (4 marks)
- c) Edwards Jenner (2 marks)
- d) Joseph Lister (2 marks)
- e) Christian Gram (2 marks)
- f) Anton Van Leuwenhoek (1 mark)
- g) Sir Alexander Fleming (2 marks)
- h) Theodor Schwann (3 marks)