



MACHAKOS UNIVERSITY

University Examinations 2019/2020 academic Year

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 OF ENVIRONMENTAL MICROBIOLOGY

DATE: 20/01/2021

TIME: 8.30-10.30 AM

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 (30 MARKS)

- a) Describe Koch's postulates. (4 marks)
- b) Distinguish between the following terms
 - i. Incubation and Isolation (2 marks)
 - ii. A true pathogen and an opportunistic pathogen (2 marks)
- c) Explain how and why the temperature of steam can be raised above 100°C. (3 marks)
- d) Explain the Abiogenesis germ theory (3 marks)
- e) Classify germicides based on their effectiveness in destroying microbes in medical settings. (4 marks)
- f) Describe three branches of microbiology (3 marks)
- g) Explain the mode of action of antimicrobial agents on the cell membrane (3 marks)
- h) Outline the contribution of **Louis Pasteur** to the history of microbiology (3 marks)
- i) Describe the route taken by a pathogen up to the time it causes a disease (3 marks)

SECTION B:

QUESTION TWO (20 MARKS)

- a) Describe the protocol of Gram staining giving the significance of each step (10 marks)
- b) Discuss the microbiological techniques (10 marks)

QUESTION THREE (20 MARKS)

- a) Discuss bacterial virulence factors (15 marks)
- b) Describe Edward Jenner's experiment (5 marks)

QUESTION FOUR (20 MARKS)

Discuss bacterial virulence factors

QUESTION FIVE (20 MARKS)

- a) Discuss the three categories of media with two illustrations in each case. (12 marks)
- b) Describe the shapes of bacteria and their possible variants. (8 marks)