



SEMESTER III FINAL EXAMINATION 2019/2020

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UNIVERSITY OF SWAZILAND

PROGRAMME: BACHELOR OF SCIENCE IN AGRONOMY YEAR 2, BACHELOR OF SCIENCE IN ANIMAL SCIENCE YEAR 2, BACHELOR OF SCIENCE IN ANIMAL SCIENCE (DAIRY OPTION) YEAR 2, BACHELOR OF SCIENCE IN FOOD SCIENCE, NUTRITION AND TECHNOLOGY YEAR 2, BACHELOR OF SCIENCE IN CONSUMER SCIENCE YEAR 2, AND BACHELOR OF SCIENCE IN HORTICULTURE YEAR 2

COURSE CODE: CPR207

TITLE OF PAPER: MICROBIOLOGY

TIME ALLOWED: TWO (2) HOURS

INSTRUCTIONS: ANSWER QUESTION ONE AND ANY OTHER THREE QUESTIONS

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QUESTION ONE IS COMPULSORY**QUESTION 1**

- a. Describe the life-cycle of the malaria causal organism. (15 Marks)
- b. It is possible to purchase the following microorganisms in a retail store. Provide a reason for buying each.
- i. *Saccharomyces cerevisiae* (2 Marks)
 - ii. *Bacillus thuringiensis* (3 Marks)
- c. Explain the following media used in a Microbiology laboratory:
- i. Complex media (2 Marks)
 - ii. Differential media (2 Marks)
 - iii. Selective media (2 Marks)
- d. In a laboratory practical the bacterium *Clostridium* is stained by applying a basic stain, carbolfuchsin, with heat, decolourising with acid alcohol, and counterstaining with an acidic stain, nigrosin. Under the microscope, describe the colour of:
- i. endospores (2 Marks)
 - ii. cells (2 Marks)
- e. Explain how Koch's postulates came about. (10 marks)
- [40 Marks]**

QUESTION 2

- a. Differentiate the following:
- i. Fimbriae and pili in bacteria (4 Marks)
 - ii. A Gram-positive and Gram-negative cell wall (8 Marks)
 - iii. Psychrophiles and psychrotrophs (4 Marks)
 - iv. Facultative anaerobes and aerotolerant anaerobes (4 Marks)
 - v. The enzymes catalase and peroxidase in bacterial respiration (4 Marks)

- b. Explain how microbes are used in the following:
 - i. Bioremediation (3 marks)
 - ii. Insect pest control (3 marks)
- [30 Marks]**

QUESTION 3

With the aid of a diagram, describe the distribution of the different types of bacteria in a liquid medium, based on their oxygen requirement

[30 Marks]

QUESTION 4

- a. Describe any three physical methods, other than heat, used to control microorganisms. (9 Marks)
- b. In microbial genetics, how is translation different from transcription? (4 Marks)
- c. What is an anticodon in microbial genetics? (2 Marks)
- d. Explain how genetic transfer occurs in bacteria. (15 Marks)

[30 Marks]