



50

SEMESTER III 2016/2017

PAGE 1 OF 3

UNIVERSITY OF SWAZILAND

EXAMINATION PAPER

PROGRAMME: BACHELOR OF SCIENCE IN AGRONOMY YEAR 2, BACHELOR OF SCIENCE IN ANIMAL SCIENCE YEAR 2, BACHELOR OF SCIENCE IN CONSUMER EDUCATION 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: CP 204

TITLE OF PAPER: MICROBIOLOGY

TIME ALLOWED: TWO (2) HOURS

INSTRUCTIONS: ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS

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THIS QUESTION IS COMPULSORY

QUESTION 1

- A. In a laboratory practical bacterium are stained with crystal violet, then mordant iodine is applied before decolourising with ethanol. A counterstain Safranin is lastly applied.
- Name this staining procedure? (3 marks)
 - Give three different scenarios of reaction, and also give the colour of the cells in each of the scenarios. (6 marks)
- B. Explain how Koch's postulates came about. (10 marks)
- C. Explain the function of the following parts of a light microscope
- Objective lenses (2 Marks)
 - Course focusing knob (4 Marks)
 - Ocular lens (2 Marks)
- D. Explain the importance of osmotic pressure in microbial growth and how it can be manipulated to control them. (10 marks)
- E. What is the MAIN difference between lysogenic and lytic cycle in viral multiplication? (3 marks)
- [40 Marks]**

QUESTION 2

- A. Describe the nutritional classification of microorganisms. (12 marks)
- B. Discuss the different toxic forms of oxygen and how some microbes overcome the toxicity. (10 marks)
- C. In the life-cycle of malaria, what is meant by?
- Schizonts? (2 marks)
 - Merozoites (2 marks)
 - Gametocytes? (2 marks)
 - The ring stage (2 marks)
- [30 Marks]**

52

QUESTION 3

The current world population of **7.3 billion** is expected to reach 8.5 billion by 2030, **9.7 billion** in 2050 and 11.2 billion in 2100, according to a new UN DESA report, "World Population Prospects: The land is not growing, if it is anything, it is shrinking as more and more land turns to deserts and global warming is adding onto the scarcity of food, which means there is a challenge as to how to feed the growing population. Modern biotechnology is proposed as one of the solutions to this problem. Growing genetically modified crops are a good example of such proposal.

- A. What are genetically modified organisms? (10 marks)
- B. Discuss the good and bad attributes of the currently available GMO crops?(10 marks)
- C. Discuss the role of GMOs in mitigating food security in the future?

(10 marks)

[30 Marks]

QUESTION 4

- A. Describe any three physical methods, other than heat, used to control microorganisms. (6 marks)
- B. In microbial genetics, compare translation and transcription processes? (4 marks)
- C. What is an anticodon in microbial genetics? (2 marks)
- D. What are the functions of mRNA and tRNA? (10 marks)
- E. What is plasmid? (3 marks)
- F. Given a jug of fresh milk that contains 10 000 bacteria per millilitre to be cultured, explain step by step how you would obtain a concentration of 10 bacteria per millilitre.

(5 marks)

[30 Marks]

HAVE YOU ANSWERED THE COMPULSORY QUESTION i.e. QUESTION 1?