



**2<sup>nd</sup> SEMESTER FINAL EXAMINATION 2015/2016**

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**UNIVERSITY OF SWAZILAND**

**FINAL EXAMINATION PAPER**

**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, BACHELOR OF SCIENCE IN CONSUMER SCIENCE EDUCATION 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**

**DO NOT OPEN THIS PAPER UNTIL PERMISSION HAS BEEN GRANTED BY THE CHIEF INVIGILATOR**

**THIS QUESTION IS COMPULSORY****QUESTION 1**

- A. Before staining (e.g. simple staining), a bacterial smear is fixed.
- (i) How is it fixed? (2 Marks)
  - (ii) Why is it fixed? (2 Marks)
- B. Describe five uses of each of the following microorganisms which are beneficial to humans
- (i) Fungi (5 marks)
  - (ii) Algae (5 marks)
  - (iii) Bacteria (5 marks)
- C. The following microorganisms can be purchased from a supermarket and agro-supply shop, respectively. Give a reason for buying each.
- (i) *Saccharomyces* (2 marks)
  - (ii) *Bacillus thuringiensis* (3 Marks)
- D. What is bioremediation and what are its benefits? (4 Marks)
- E. In microbial genetics, what is meant by:
- (i) A promoter (3 Marks)
  - (ii) A terminator (3 Marks)
  - (iii) Translation (2 Marks)
  - (iv) A codon (2 Marks)
  - (v) Degeneracy (2 Marks)

**[40 Marks]****QUESTION 2**

- A. Explain the function of the following parts of a light microscope
- (i) Objective lenses (2 Marks)
  - (ii) Diaphragm (2 Marks)
  - (iii) Condenser (2 Marks)
  - (iv) Ocular lens (2 Marks)
- B. (i) What is a plasmid? (2 Marks)
- (ii) What role does a plasmid play in a bacterial cell? (2 Marks)
- (iii) Discuss the nutritional classification of microorganisms based on the combination of energy and carbon sources. (12 Marks)
- (iv) What are:
- a. Acidophiles (2 Marks)
  - b. Lichens (2 Marks)
  - c. Facultative halophiles (2 Marks)

**[30 Marks]**

**QUESTION 3**

- A. Define the following:
- (i) Generation time (3 Marks)
  - (ii) Thermal death point (TDP) (3 Marks)
  - (iii) Obligate parasite (3 Marks)
  - (iv) Transposones (3 Marks)
  - (v) Halophiles (3 Marks)
  - (vi) Interferons (3 Marks)
- B. Genetically most bacteria are monomorphic, however, environmental conditions can result in pleomorphic bacteria.
- i. Explain what the statement means. (4 marks)
  - ii. Give an example of a bacterium that is genetically pleomorphic. (2 marks)
- C. Which microorganisms produce endospores and for what purpose? (6 Marks)  
**[30 Marks]**

**QUESTION 4**

- A. With the aid of a well-labelled diagram, describe what happens to a bacterial population as it grows in a given medium. (15 marks)
- B. 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)
- C. From a Petri dish on which 1 mL of sour milk was cultured, after four serial dilutions were made, a total of 56 colonies were counted. What was the original number of bacterial cells per millilitre that were in the original sour milk? (5 marks)
- C. List Koch's postulates (5 Marks)  
**[30 Marks]**

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