

UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER 2008 - 2009

TITLE OF PAPER: APPLIED BIOLOGY

COURSE CODE: B405

TIME ALLOWED: THREE HOURS

- INSTRUCTIONS:
1. ANSWER ANY FOUR QUESTIONS, ONE QUESTION FROM EACH SECTION.
 2. USE ONE (1) ANSWER BOOKLET FOR EACH SECTION.
 3. EACH QUESTION CARRIES TWENTY FIVE (25) MARKS.
 4. WHEREVER POSSIBLE ILLUSTRATE YOUR ANSWERS WITH LARGE CLEARLY LABELLED DIAGRAMS.

SPECIAL REQUIREMENTS:

USE SEPARATE EXAMINATION ANSWER FOLDERS, ONE FOR EACH SECTION [A, B, C, D]. FOLDERS SHOULD BE PROMINENTLY MARKED TO INDICATE THE SECTION.

THIS PAPER IS NOT TO BE OPENED UNTIL PERMISSION HAS
BEEN GRANTED BY THE INVIGILATORS

SECTION A

QUESTION 1

Write an essay on "the role of water quality controllers in sanitary microbiology.

[TOTAL MARKS = 25]

QUESTION 2

(a) What is serology? (2 marks)

(b) Explain the concepts behind precipitation and agglutination reactions.

(10 marks)

(c) Write short notes on the following:

(i) intradermal tests in humans (4 marks)

(ii) application of monoclonal antibodies (4 marks)

(iii) complement fixation tests (5 marks)

[TOTAL MARKS = 25]

SECTION B

QUESTION 3

Using named examples, discuss factors which lead to the development of pest status by organisms.

[TOTAL MARKS = 25]

QUESTION 4

Analyse the concept of biological control.

[TOTAL MARKS = 25]

SECTION C

QUESTION 5

(a) Explain the terms alkalinity, conductivity and morphoedaphic index (MEI) and relate them to gross primary production in tropical lakes. (10 marks)

(b) Distinguish between extensive and intensive aquaculture systems. Make a case for the development of large-scale fish farms in Swaziland. (15 marks)

[TOTAL MARKS = 25]

QUESTION 6

(a) Name three human water-borne parasitic diseases that may be found in Swaziland and indicate their intermediate hosts and symptoms. (9 marks)

(b) What are pollutants? Discuss with examples the pollutants you will expect in the Usuthu River flowing through Bhunya and Siphofaneni and also note their effects on the flora and fauna of that section of river system. (16 marks)

[TOTAL MARKS = 25]

SECTION D

QUESTION 7

Knowledge of biology and chemistry are essential in some aspects of plant pathology. Support this observation using pathogen modes of tissue invasion.

[TOTAL MARKS = 25]

QUESTION 8

- (a) If an apparently new plant disease is reported to you, how would you identify it?
(10 marks)
- (b) What preliminary management procedures would you suggest and why?
(15 marks)

[TOTAL MARKS = 25]