

UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER 2007/2008

TITLE OF PAPER: APPLIED BIOLOGY

COURSE CODE: B405

TIME ALLOWED: THREE HOURS

- INSTRUCTIONS:
1. THIS PAPER IS DIVIDED INTO TWO SECTIONS. ANSWER EACH SECTION IN A SEPARATE BOOKLET.
 2. EACH QUESTION CARRIES TWENTY FIVE (25) MARKS.
 3. ILLUSTRATE YOUR ANSWERS WITH LARGE AND CLEARLY LABELLED DIAGRAMS WHERE APPROPRIATE.
 4. ANSWER ANY TWO QUESTIONS FROM EACH SECTION.

SPECIAL REQUIREMENTS:

NONE

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

SECTION A

INSTRUCTIONS: Answer any two (2) questions from this section.

QUESTION 1

- a) Use Van de Plank's equation to explain the principles behind plant disease control. **(3 marks)**
- b) If $r = 3.0$ per year for a polyetic pathogen, how much disease would you expect to observe? **(2 marks)**
- c) Write an essay on monocyclic, polyetic and polycyclic diseases of plants. **(20 marks)**

[TOTAL MARKS = 25]

QUESTION 2

- a) How would you identify a previously unknown disease? **(5 marks)**
- b) Write an essay on bacterial wilt of tomatoes or tobacco. **(20 marks)**

[TOTAL MARKS = 25]

QUESTION 3

- a) Explain how you would diagnose plant diseases caused by fungi and bacteria. **(10 marks)**
- b) Describe the following:
 - (i) Necrotic symptoms **(7 marks)**
 - (ii) Hyperplastic symptoms **(8 marks)**

[TOTAL MARKS = 25]

SECTION B

ANSWER ANY TWO (2) QUESTIONS FROM THIS SECTION.

QUESTION 4

Discuss the development process and potential value of genetically modified Bt cotton *Gossipium hirsutum*.

[25 MARKS]

QUESTION 5

Outline the possible advantages of genetic engineering in economic plants.

[25 MARKS]

QUESTION 6

Explain how you might evaluate a new cultivar of tomatoes *Solanum esculentum* on the aspects of yield and pathogen/pest resistance.

[25 MARKS]