UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER 2008/2009

TITLE OF PAPER: CRYPTOGAMIC BOTANY

COURSE CODE: B201

TIME ALLOWED: THREE HOURS

INSTRUCTIONS:
1. ANSWER FOUR QUESTIONS, ONE QUESTION FROM EACH SECTION
2. EACH QUESTION CARRIES TWENTY FIVE (25) MARKS
3. ILLUSTRATE YOUR ANSWERS WITH LARGE AND CLEARLY LABELLED DIAGRAMS WHERE APPROPRIATE

SPECIAL REQUIREMENTS:

NONE

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

SECTION A
Bacteria

QUESTION 1

a) Draw and label a cross section of a Gram Negative wall showing the various layers and a flagellum. Indicate the appropriate dimensions of each part. (10 marks)

b) What are the functions of the following:
   (i) periplasmic space (2 marks)
   (ii) mesosome (2 marks)
   (iii) flagellum (2 marks)
   (iv) capsule (2 marks)
   (v) outer membrane (2 marks)

c) Draw the structure of peptidoglycan. (5 marks)

[TOTAL MARKS = 25]

QUESTION 2

a) Draw and label a section of a Gram positive wall indicating approximate dimensions of parts. (5 marks)

b) Give at least five reasons that make bacteria eukaryotic organisms. (5 marks)

c) Explain using annotated diagrams how:
   (i) genetic recombination is achieved when the donor strands are single stranded and double stranded (5 marks)
   (ii) genetic recombination in bacteria is achieved during transduction. (10 marks)

[TOTAL MARKS = 25]

SECTION B
Fungi

QUESTION 3

(a) Write brief notes on the following:
   (i) Vesicular – arbuscular mycorrhizae (3 marks)
   (ii) The mechanism of parasitism and predation in the zoopagales. (3 marks)
   (iii) Conjugative nuclear division in the growth of a dikaryotic mycelium. Illustrate your answer. (3 marks)
   (iv) Development of basidia and basidiospores from a dikaryotic mycelium. Illustrate your answer. (3 marks)
   (v) Spermatization and the production of dikaryotic mycelium. (3 marks)

(b) Draw and fully label the life cycle of Plasmopara viticola. (10 marks)

[TOTAL MARKS = 25]

QUESTION 4

(a) What are the characteristics of fungi? (5 marks)

(b) Prepare a dichotomous key to illustrate how variations of the ascocarp have been used to group members of the division Ascomycotina into classes. (10 marks)

(c) Draw and fully label the life cycle of Mucor hiemalis. (10 marks)

[TOTAL MARKS = 25]

SECTION C
Algae

QUESTION 5

(a) Explain how the following are used in reproduction of the Cyanophyta.
- (i) hormogonia (2 marks)
- (ii) akinetes (2 marks)
- (iii) heterocysts (2 marks)

(b) Explain the following types of reproduction:
- (i) conjugation in Spirogyra (4 marks)
- (ii) nannandrous oogamous process in Oedogonium (10 marks)

(c) (i) Prepare a table to compare the cell wall of true desmids and saccodem desmids. (3 marks)

(ii) How do desmids reproduce asexually. (2 marks)

[TOTAL MARKS = 25]

QUESTION 6

Discuss the range of vegetative in algae using examples drawn from Chlorophyceae.

[TOTAL MARKS = 25]

SECTION D
Bryophytes

QUESTION 7

(a) With the help of well illustrated diagrams, explain spore production and release methods in:
- (i) Marchantia

(ii) Anthoceros
(iii) Mnium (15 marks)

(b) Point out the strengths and weaknesses of each method as a means of reproduction and dissemination of the bryophyte. (10 marks)

[TOTAL MARKS = 25]

QUESTION 8

(a) What are the characteristics of bryophytes. (5 marks)

(b) Prepare a table to compare bryophytes to thallophytes. List at least ten criteria. (10 marks)

(c) Using well illustrated diagrams, explain the series of events in Marchantia development, starting with a fertilized egg within an archegonium and ending in the production of a haploid gametophyte. (10 marks)

[TOTAL MARKS = 25]