UNIVERSITY OF SWAZILAND

SUPPLEMENTARY 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) Prepare a table of the wall composition of Gram positive and Gram negative bacteria. **NB:** Do not include the peptidoglycan. (5 marks)

(b) Explain how, genetic recombination occurs when the donor DNA is single stranded and double stranded. (5 marks)

(c) In the following matings the F factor is present in two different positions compared to chromosomal DNA. Explain how this affects the products of the matings i.e. production of recombinants and transfer of the plasmid. Illustrate your answer.

(i) $F^+ \times F^-$ (5 marks)

(ii) Hfr × F^- (10 marks)

[TOTAL MARKS = 25]

QUESTION 2

(a) Draw and fully label a generalized bacterial growth curve and explain all the gradients. (5 marks)

(b) Fully explain

(i) at least five functions of the bacterial cell wall (5 marks)

(ii) three functions of the capsule (3 marks)

(iii) two functions of the fimbriae or pili (2 marks)

(c) Why and how do bacteria produce endospores? (10 marks)

[TOTAL MARKS = 25]

SECTION B
Fungi

QUESTION 3

(a) Using well labeled diagrams and brief explanations, differentiate between the following:

(i) Penicillium and Aspergillus (3 marks)

(ii) a pycnidium and a perithecium (3 marks)

(iii) a sporodochium and a synnema (3 marks)

(iv) an acervulus and a pustule (3 marks)

(v) a heterobasidiomycete and a honobasidiomycete (3 marks)

(b) Draw and fully label the life cycle of Penicillium/Talaromyces. (10 marks)

[TOTAL MARKS = 25]

QUESTION 4

(a) Using scientifically named examples, discuss the economic importance of fungi in the division Ascomycotina. (5 marks)

(b) Prepare a flow chart to illustrate possible evolutionary relationships among downy mildew fungi. (10 marks)

(c) Draw or briefly describe the fruiting structures used to identify the following fungi: (10 marks)

Pilobolus
Zygorrhynchus
Phycomyces
Mortierella
Uncinula
Phyllactinia
Rhizopus stolonifer
Phytophthora
Albugo
Rhizoctonia

[TOTAL MARKS = 25]

SECTION C
Algae

QUESTION 5

(a) Draw and fully label the gametangia of Chara then explain its oogamous reproductive process. (10 marks)

(b) Using the five classification criteria by Ian Morris, list the general characteristics of the three large divisions of algae i.e.

(i) Chlorophyta (5 marks)
(ii) Phaeophyta (5 marks)
(iii) Rhodophyta (5 marks)

[TOTAL MARKS = 25]

QUESTION 6

Discuss the classification criteria used by Ian Morris in algae. Cite examples to enhance your answer.

[TOTAL MARKS = 25]

SECTION D
Bryophytes

QUESTION 7

Discuss the biology of Anthoceros using the following sub-titles:

- habitat; - gametophyte; - gametangia; - sporophyte

Illustrate your answer. (15 marks)

(b) Compare the sporophyte of Anthoceros to that of liverworts. (10 marks)

[TOTAL MARKS = 25]

QUESTION 8

"Mosses are the least evolved class of bryophytes". Support or refute this statement.

[TOTAL MARKS = 25]