UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER 2008/2009

TITLE OF PAPER: SPERMATOPHYTA

COURSE CODE: B301

TIME ALLOWED: THREE HOURS

INSTRUCTIONS:

1. ANSWER ANY 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

Pteridophytes

QUESTION 1

(a) Using relevant illustrations, discuss the life cycle of Equisetum. (20 marks)

(b) What characteristics of Equisetum puts it in the order Equisetales. (5 marks)

[TOTAL MARKS = 25]

QUESTION 2

(a) Discuss the evolutionary tendencies among ferns (Pterophyta). Consider at least ten (10) criteria in their primitive and advanced states. Cite specific examples in each case. (15 marks)

(b) Differentiate between eusporangiate and leptosporangiate ferns. Consider at least ten aspects. (10 marks)

[TOTAL MARKS = 25]

SECTION B

Taxonomy

QUESTION 3

(i) Plant taxonomists heavily rely on floral characteristics in their work. How do they believe the flower evolved? (5 marks)

(ii) Draw Bessey's chart on how angiosperm families could have evolved. (8 marks)

(iii) Explain the evolutionary changes that could have occurred to the flower along each line. (12 marks)

[TOTAL MARKS = 25]

QUESTION 4

Choose **any two** families of economic importance to Swaziland from the following list:

Poaceae (12½ marks)

Rutaceae or (12½ marks)

Saxifragaceae (12½ marks)

Discuss each family under the following headings.

(i) Economic importance

(ii) Floral diagram

(iii) Floral formula

(iv) Evolution of the flower from *Ranunculaceae*.

[TOTAL MARKS = 25]

SECTION C

Gymnosperm/Angiosperm

QUESTION 5

(a) Outline megasporocyte maturation and embryo differentiation in Pinus. (10 marks)

(b) Outline megasporocyte maturation and embryo differentiation in Carex. (10 marks)

(c) List differences between Pinus and Carex observed from the stages you discussed in (a) and (b). (5 marks)

[TOTAL MARKS = 25]

QUESTION 6

(a) Prepare a table to compare gymnosperms with angiosperms (similarities and differences). Consider all generations in their life cycles. (10 marks)

(b) Prepare a flow chart outlining a generalized life history of an angiosperm. (10 marks)

(c) What are the anatomical differences between dicotyledons and monocotyledons? (5 marks)

[TOTAL MARKS = 25]

SECTION D

Anatomy

QUESTION 7

Cells mature in order to perform their functions efficiently. Support this observation using the maturation processes of:

a) tracheary elements (13 marks)

b) sieve elements (12 marks)

[TOTAL MARKS = 25]

QUESTION 8

Write an essay on xylem. Your answer should include maturation, distribution:

- cell types & cell functions
- tissue organization
- distribution and function of the xylem

[TOTAL MARKS = 25]