

UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER 2007

TITLE OF PAPER: SPERMATOPHYTA

COURSE CODE: B301

TIME ALLOWED: THREE HOURS

INSTRUCTIONS:

1. ANSWER FOUR QUESTIONS AND AT LEAST ONE 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) What similarities exist between bryophytes and pteridophytes.
(5 marks)
- (b) Discuss the theories presented to explain the evolution of the sporophyte among pteridophytes (ie. leaves and stele). (20 marks)
- [25 MARKS]**

QUESTION 2

- (a) Diagrammatically discuss the life history of Polypodium, a member of Pterophyta. (10 marks)
- (b) Prepare a table to compare the following pteridophytes:
Polypodium, Equisetum, Selaginella and Lycopodium using the following criteria. Draw sketches where necessary.
- (i) gametophyte
 - (ii) strobili/sporangia
 - (iii) spores
- (15 marks)
- [25 MARKS]**

SECTION B**Gymnosperms****QUESTION 3**

- a) Use well labelled diagrams and brief notes to explain the following stages in the life of a pine.
- (i) Formation of an archegonium from a megaspore mother cell.
(5 marks)
 - (ii) Formation of a male gametophyte from a microspore. (5 marks)
 - (iii) Formation of an embryo-sporophyte from a fertilized egg.
(5 marks)

- b) Use morphological, anatomical and reproductive structures to differentiate between gymnosperms from angiosperms. (10 marks)

[25 MARKS]

QUESTION 4

- (a) Draw and label transversal sections of a gymnosperm stem with an ectophloic siphonostele during (i) primary growth
(ii) secondary growth (10 marks)
- (b) Explain, using well labelled sketches, how the secondary body was developed in (i) epidermis
(ii) cortex
(iii) vascular system (15 marks)

[25 MARKS]

SECTION C

Taxonomy

QUESTION 5

Present day angiosperm families arose from an ancestor whose reproductive structure was very similar to a strobilus. Support this notion using arguments of published scientists.

[25 MARKS]

QUESTION 6

Discuss the unique floral, morphological and economic features of these common families.

- | | | |
|----|----------------|-----------|
| a) | Papilionaceae | (5 marks) |
| b) | Amaryllidaceae | (5 marks) |
| c) | Orchidaceae | (5 marks) |
| d) | Poaceae | (5 marks) |
| e) | Brassicaceae | (5 marks) |

[25 MARKS]

SECTION D

Anatomy

QUESTION 7

- a) Discuss the differentiation and maturation of vessel members.
(10 marks)
 - b) Explain the differentiation of sieve-tube members with their companion cells.
(10 marks)
 - c) Discuss collenchyma.
(5 marks)
- [25 MARKS]**

QUESTION 8

Discuss primary xylem.

[25 MARKS]