

UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER 2007/2008

TITLE OF PAPER: SPERMATOPHYTA

COURSE CODE: B301

TIME ALLOWED: THREE HOURS

INSTRUCTIONS:

1. ANSWER 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) Discuss the theories that have been presented to explain the evolution of the sporophyte (i.e. leaves and stele) among pteridophytes. (15 marks)
- (b) Discuss, with the help of diagrams, the life history of Polypodium. (10 marks)

[TOTAL MARKS = 25]

**QUESTION 2**

- (a) Use a table and illustrations to differentiate eusporangiate from leptosporangiate ferns. (10 marks)
- (b) Outline the life history and biology of Selaginella. (15 marks)

[TOTAL MARKS = 25]

**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) the maturation of the male gametophyte in Pinus. (5 marks)
  - (ii) the maturation of the female gametophyte in Pinus. (5 marks)
  - (iii) the maturation of the female gametophyte in Lillium. (5 marks)
  - (iv) the differences between the life history of conifers and cycads (10 marks)

[TOTAL MARKS = 25]

**QUESTION 4**

- (a) Explain the development of a secondary body in the stem of a conifer. (N.B. Consider the epidermis, cortex and vascular system). Illustrate your answer. (15 marks)
- (b) Draw well labelled diagrams to show the tissues of a pine and a monocotyledonous leaf in transversal section. List the differences between them. (10 marks)

[TOTAL MARKS = 25]

**SECTION C**

**Taxonomy**

**QUESTION 5**

- (i) What do members of the superclass Fabaceae have in common? (5 marks)
- (ii) Comparatively discuss the three families in Fabaceae. (20 marks)

[TOTAL MARKS = 25]

**QUESTION 6**

Using Bessey's evolutionary characteristics, floral formulae and examples, explain how monocot families could have evolved from Ranunculaceae. Clearly explain how any new floral structures you mentioned could have arisen.

[TOTAL MARKS = 25]

**SECTION D**

**Anatomy**

**QUESTION 7**

Discuss the basic structure, functions and variations of:-

- a) Parenchyma cells (10 marks)
- b) Sclerenchyma tissue (15 marks)

[TOTAL MARKS = 25]

**QUESTION 8**

- a) Prepare a table of the cells and tissues in primary xylem. (5 marks)
- b) Use annotated diagrams to explain
  - (i) maturation of the unique cells of xylem (10 marks)
  - (ii) maturation of the unique cells of phloem (10 marks)

**[TOTAL MARKS = 25]**