

UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER 2013/2014

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 (GYMNOSPERMS)

Answer one question from this section

QUESTION 1

- a) List the general characteristics of members of the order Equisetales (Horsetails). (5 marks)
- b) Draw and label the spore bearing structure of *Equisetum* and explain sporangium dehiscence, spore release and dissemination. (10 marks)
- c) Prepare a table to compare primitive and advanced features in the evolution of pteridophytes. (10 marks)

[TOTAL MARKS = 25]

QUESTION 2

- a) Prepare a table to suggest possible evolutionary trends among ferns. (10 marks)
- b) Discuss the evolution of the sporophyte of pteridophytes under the following subtitles:
 - i) Evolution of macrophyllous leaves – Telome Theory, (5 marks)
 - ii) Evolution of microphyllous leaves – Enation Theory, (5 marks)
 - iii) Evolution of the pith – Intrusion and Intracyclic theories (5 marks)

NB: Illustrate your answers

[TOTAL MARKS = 25]

SECTION B (PTERIDOPHYTES)

Answer one question from this section

QUESTION 3

- a) Prepare a table to differentiate between coniferales and cycadales. (10 marks)

- b) i) Draw and label transversal sections of a pine needle and a dicotyledonous leaf. (10 marks)
- ii) List the differences between the two leaves you drew in 1 (b) (i). (5 Marks)

[TOTAL MARKS = 25]

QUESTION 4

Describe and illustrate the life cycle of a pine. Note that the following stages should be clearly explained:

- i) Megaspore development (8 marks)
- ii) Microspore development (9 marks)
- iii) Embryo development (8 marks)

[TOTAL MARKS = 25]

SECTION C (TAXONOMY)

Answer one question from this section

QUESTION 5

- a) Plant taxonomists heavily rely on floral characteristics in their work. How do they believe the flower evolved? (5 marks)
- b) Draw Bessey's chart on how angiosperm families could have evolved. (8 marks)
- c) Explain the evolutionary changes that could have occurred to the flower along each line. (12 marks)

TOTAL MARKS = 25]

QUESTION 6

- (a) Discuss family Fabaceae and differentiate the component sub-families. (15 marks)
- (b) What other characteristics besides floral ones are also considered in taxonomy? (10 marks)

[TOTAL MARKS = 25]

SECTION D (ANATOMY)

Answer one question from this section

QUESTION 7

Discuss the vascular system in angiosperms.

(25 marks)

[TOTAL MARKS = 25]

QUESTION 8

- a) Discuss the tunica-carpus theory in the root apical meristem. Illustrate the position of the initials. (15 marks)
- b) Tabulate differences between dicots and monocots. Illustrate anatomical differences. (10 marks)

[TOTAL MARKS = 25]