

UNIVERSITY OF SWAZILAND

MAIN EXAMINATION PAPER 2016/2017

TITLE OF PAPER: SPERMATOPHYTA

COURSE CODE: B301/BIO252

TIME ALLOWED: THREE HOURS

- INSTRUCTIONS:
1. THIS PAPER IS DIVIDED INTO FOUR SECTIONS
 2. ANSWER ANY FOUR (4) QUESTIONS, ONE (1) QUESTION FROM EACH SECTION.
 3. EACH QUESTION CARRIES TWENTY FIVE (25) MARKS.
 4. ILLUSTRATE YOUR ANSWERS WITH LARGE AND CLEARLY LABELLED DIAGRAMS WHERE APPROPRIATE.

SPECIAL REQUIREMENTS: NONE

HIS PAPER IS NOT TO BE OPENED UNTIL PERMISSION HAS
BEEN GRANTED BY THE INVIGILATORS

SECTION A (PTERIDOPHYTES)

Answer one question from this section

QUESTION 1

- a) Use a series of well labelled diagrams to explain the following:
- i) Evolution of equisetaceous sporangiophores (5 marks)
 - ii) Evolution of microphyllous leaves – Enation theory (5 marks)
 - iii) Evolution fo lycopod sporophylls – Enation theory (5 marks)
- b) Describe or define the following terms about/in *Selaginella*
- i) Rhizophores (2 marks)
 - ii) Trabeculae (2 marks)
 - iii) Archesporial cells (2 marks)
 - iv) Androgonial cells (2 marks)
 - v) Type of strobilus (2 marks)

[TOTAL MARKS = 25]

QUESTION 2

- a) Prepare a table of criteria that differentiate eusporangiatae from leptosporangiatae in division Pterophyta.
(10 marks)
- b) Discuss the life cycle of *Polypodium* using well labelled diagrams and brief notes.
(15 marks)

[TOTAL MARKS = 25]

SECTION B

Answer one question from this section

QUESTION 3

- a) Draw a diagram to show all the tissues in a transversal section of a stem of *Pinus* with four vascular bundles (Primary body). (5 marks)

- b) Explain differentiation of a secondary body in the conducting system of *Pinus*.
Draw and label the conducting cells in xylem and phloem of *Pinus*.
(5 marks)

- c) Explain differentiation of a secondary body below the epidermis of a *Pinus* stem. Draw and label the cells. (5 marks)

- d) Draw and label the secondary body of a transversal section of a pine stem that had four (4) vascular bundles in its primary state.
(10 marks)

[TOTAL MARKS = 25]

QUESTION 4

Discuss the life cycle of a pine (*Pinus*). Draw well labelled diagrams to explain nuclear division and the fate of its products in the following stages:

- i) Megasporocyte maturation (8 marks)
- ii) Microsporocyte maturation (9 marks)
- iii) Embryo development (8 marks)

[TOTAL MARKS = 25]

SECTION C (TAXONOMY)

Answer one question from this section

QUESTION 5

Discuss the family Fabaceae and compare its sub-families using a table.

TOTAL MARKS = 25]

QUESTION 6

- (a) Discuss the evolution of a flower according to Bessey. Tabulate the criteria in their primitive and advanced stages. (7 marks)
- (b) Discuss floral evolution from Ranunculaceae to Lamiaceae according to Bessey. Point out which aspects of the flower changed and why. (18 marks)

[TOTAL MARKS = 25]

SECTION D (ANATOMY)

Answer one question from this section

QUESTION 7

- a) Write brief notes on the following cells.
- i) Parenchyma (4 marks)
 - ii) Collenchyma (6 marks)
- b) Explain the maturation and development of vessel members from parenchyma cells. Illustrate your answer. (15 marks)

[TOTAL MARKS = 25]

QUESTION 8

- a) Write an essay on sclereids in plants. Cite examples and illustrate your answer. (10 marks)
- b) Discuss the maturation of sieve-tube members. Illustrate your answer. (10 marks)
- c) List at least five (5) anatomical differences between monocotyledons and dicotyledons. (5 marks)

[TOTAL MARKS = 25]

END OF EXAMINATION PAPER