

UNIVERSITY OF SWAZILAND
RE-SIT EXAMINATION PAPER 2018/2019

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 COUNTS TWENTY FIVE (25) MARKS.**
 - 4. 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)
Answer **one** question from this section

QUESTION 1

- a) Use a series of labelled diagrams to explain the following:
- i. Evolution of equisetaceous sporangiophores (5 marks)
 - ii. Evolution of microphyllous leaves – enation theory (5 marks)
 - iii. Evolution of lycopod sporophylls – enation theory (5 marks)
- b) Briefly describe or define the following terms relating to 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) Tabulate the criteria that differentiate eusporangiatae ferns from leptosporangiatae ferns in the division Pterophyta. (10 marks)
- b) Discuss the life cycle of *Polypodium* using labelled diagrams and a brief explanation. (15 marks)

[TOTAL MARKS = 25]

SECTION B

Answer **one** question from this section

Question 3

- a) Use a labelled diagram to illustrate all the tissues in a transversal section of the stem of *Pinus* with four vascular bundles (Primary body). (5 marks)
- b) Explain differentiation of a secondary body in the conducting system of *Pinus*. Use a labelled diagram to illustrate conducting cells in xylem and phloem of *Pinus*. (5 marks)
- c) Explain the differentiation of a secondary body below the epidermis of a *Pinus* stem. Using a labelled diagram. (5 marks)
- d) Use a labelled diagram to illustrate the secondary body of a transversal section of a pine stem that has four (4) vascular bundles in its primary state. (10 marks)

[TOTAL MARKS=25]

QUESTION 4

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

- i. Megaspore maturation (8 marks)
- ii. Microspore 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 tabulate the differences and similarities between its sub-families.

[TOTAL MARKS=25]

Question 6

- a) Discuss the evolution of a flower according to Bessey. Tabulate the criteria in their primitive and advance stages. (7 marks)

- b) Discuss floral evolution from Ranunculaceae to Lamiaceae according to Bessey. Point out which aspects of the flower changed and explain why.

(18 marks)

[TOTAL MARKS=25]

SECTION D (ANATOMY)

Answer **one** question from this section

QUESTION 7

- a) Briefly describe the following cells.
- i. Parenchyma (4 marks)
 - ii. Collenchyma (6 marks)
- b) Explain the maturation and development of vessel members from parenchyma cells Use a diagram to illustrate your answer.

(15 marks)

[TOTAL MARKS=25]

QUESTION 8

- a) Write an essay on sclereids in plants. Cite examples and use a diagram to illustrate your answer. (10 marks)
- b) Discuss the maturation of sieve-tube members. Use a diagram to 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