

UNIVERSITY OF SWAZILAND

SUPPLEMENTARY EXAMINATION PAPER 2017/2018

TITLE OF PAPER: SPERMATOPHYTA

COURSE CODE: B301/BIO252

TIME ALLOWED: THREE HOURS

INSTRUCTIONS:

1. ANSWER ANY FOUR QUESTIONS.
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

**QUESTION 1**

- a) (i) Define a seed. (2 marks)  
(ii) Explain how a seed evolved (3 marks)
- b) Explain the development of a dicotyledonous embryo from a diploid zygote. Illustrate key steps. (15 marks)
- c) Draw and label a mature monocotyledonous embryo. (5 marks)

**[TOTAL MARKS = 25]**

**QUESTION 2**

- a) Draw and label a map of a transversal section of:  
(i) a pine needle, (5 marks)  
(ii) a dicotyledonous leaf. (5 marks)
- b) Explain the differences between pine needles and angiosperm leaves. (5 marks)
- c) Tabulate the differences between coniferales and cycadales. (10 marks)

**[TOTAL MARKS = 25]**

**QUESTION 3**

- a) Explain the histogen theory of structural development and differentiation in roots. Illustrate your answer with map diagrams showing the initials and their derivatives. (15 marks)
- b) Discuss the structure and characteristics of parenchyma cells and explain why they are considered a life-line of plants. (10 marks)

**[TOTAL MARKS = 25]**

**QUESTION 4**

- a) Discuss the differentiation and maturation of sieve tube members and their companion cells. Illustrate each step. (10 marks)
- b) Discuss sclerenchyma in terms of the following:
- (i) Sclereids, (10 marks)
  - (ii) Fibres. (5 marks)

**[TOTAL MARKS = 25]**

**QUESTION 5**

Read the following description of a flower:

Calyx: Five sepals; gamosepalous; aestivation is valvate

Corolla: Five petals; polypetalous; aestivation is contorted

Androecium: Numerous stamens; monadelphous; at the base; staminal tube adnates to petal; anthers are one celled and dorsifixed

Gynoecium: Consists of 5 carpels; syncarpous; multilocular; each loculus bears one ovule; placentation is axile; styles are united by but stigmas are free; the style passes through the staminal tube; there are five stigmas; superior ovary

The flower: Is actinomorphic; perfect; complete; hypogynous and pentamerous

- a) Determine the floral formula (10 marks)
- b) Write the symbols that represent each description of the flower. i.e.
- (i) Actinomorphic (1 mark)
  - (ii) Perfect (1 mark)
  - (iii) Complete (1 mark)
  - (iv) Hypogynous (1 mark)
  - (v) Pentamerous (1 mark)
- c) Draw the floral diagram. (10 marks)

**[TOTAL MARKS = 25]**

**QUESTION 6**

- a) Tabulate the characteristics taken into account when delineating Fabaceae into its component sub-families. (15 marks)
  
- b) Describe factors and/or characteristics supporting the grouping of the members of Fabaceae in the old family Leguminosae.(10 marks)

**END OF EXAMINATION PAPER**