UNIVERSITY OF SWAZILAND

FINAL 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

Describe and illustrate the life cycle of *Pinus* (a pine) in terms of:

a) Maturation of the female gametophyte from the megasporocyte, (8 marks)

b) Maturation of the male gametophyte from the microsporocyte. (10 marks)

c) Embryo development from the zygote. (7 marks)

[TOTAL MARKS = 25]

QUESTION 2

a) Draw and label a transversal section through a stem of *Pinus* in its primary body, indicating the ectophloic, collateral and open vascular bundles. (10 marks)

b) Using diagrams, explain the formation of a secondary body in the following:

(i) vascular bundles and adjacent interfascicular tissue. (5 marks)

(ii) tissue below the epidermis. (5 marks)

c) (i) Explain the terms ectophloic, collateral and open vascular bundle. (3 marks)

(ii) Draw and label an amphiphloic closed vascular bundle. (2 marks)

[TOTAL MARKS = 25]

QUESTION 3

a) Tabulate the differences between monocotyledons and dicotyledons. (10 marks)

b) Explain and illustrate steps in the maturation of an embryo sac that will produce a 5n endosperm seed. Illustrate the steps. (10 marks)

c) Briefly explain how maturation of a 5n endosperm embryo sac differs from that of a *Pinus* female gametophyte? (5 marks)

[TOTAL MARKS = 25]

QUESTION 4

a) Discuss the differentiation and maturation of vessel members. Illustrate each step. (15 marks)

b) Describe the other cells of the xylem and their function. (10 marks)

[TOTAL MARKS = 25]

QUESTION 5

a) Briefly describe at least ten plant characteristics, besides the flower, that can be used in taxonomy. (10 marks)

b) Tabulate the differences between primitive and advanced characteristics of a flower as proposed by Bessey. (5 marks)

c) Draw Bessey's chart that shows how angiosperm families could have evolved. (10 marks)

[TOTAL MARKS = 25]

QUESTION 6

a) Tabulate the characteristics presented in splitting Fabaceae into its component sub-families. (15 marks)

b) What factors or characteristics supported the grouping of the members of Fabaceae in the old family Leguminosae? (10 marks)

[TOTAL MARKS = 25]

END OF EXAMINATION PAPER