



2ND SEMESTER 2010/2011

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**UNIVERSITY OF SWAZILAND
FINAL EXAMINATION PAPER**

PROGRAMME: B.Sc. IN AGRICULTURAL EDUCATION YEAR 3

B.Sc. IN AGRONOMY YEAR 3

B.Sc. IN HORTICULTURE YEAR 3

COURSE CODE: CP 305

TITLE OF PAPER: CROP PHYSIOLOGY

TIME ALLOWED: TWO (2) HOURS

**INSTRUCTIONS: ANSWER ANY FOUR QUESTIONS ALL QUESTIONS
CARRY EQUAL MARKS.**

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CHIEF INVIGILATOR**

QUESTION 1

- A. Explain the following phenomena (found in plants): osmosis, plasmolysis and imbibition. (5 Marks)
- B. Describe the mass flow mechanism of phloem transport and supplement this description with the requisite details of anatomy and plant water potential. (10 marks)
- C. What do you understand by “light” and “dark” reactions in photosynthesis? (10 marks) [25 Marks]

QUESTION 2

Write brief notes on the sources, functions and deficiency symptoms of three (3) major nutrients in crop plants. [25 Marks]

QUESTION 3

Seed collected by a desert hermit were subjected to various treatments and then evaluated in a standard germination test. The results were as follows:

Treatment prior to germination test	% germination	
	5 days	10 days after planting
a) None (control)	5%	8%
b) Soaked in warm water for an hour	5%	90%
c) GA added to seeds	5%	9%
d) GA added after soaking	95%	95%
e) GA + ABA added after soaking	5%	7%
f) Auxin added to seeds	95%	96%

Chromatographic analysis of water from treatment b) indicated GA and ABA, but no auxin. Extracts from soaked seeds contained no GA, ABA, or auxin. But, extracts from germinating seed contained GA and auxin, but no ABA.

Propose a model for these observations and indicate how your model explains the results.

[25 Marks]

QUESTION 4

An investigator from Malkerns Research Station, has been studying the effects of removing some of the leaves and tassel from a maize plant. He found that seed yields were higher for the plants from which the leaves and tassel had been removed. Explain possible reasons for the increase in seed yield. **[25 Marks]**

QUESTION 5

- A. Describe vernalisation process. Discuss the physiological processes that take place when a crop seed is vernalised. **(15 Marks)**
- B. Distinguish between C3, C4 and CAM plants. **(10 Marks)**
- [25 Marks]**