



1st SEM. 2005/2006

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UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER

**PROGRAMME: BACHELOR OF SCIENCE IN AGRICULTURE -
CROP PRODUCTION
BACHELOR OF SCIENCE IN AGRICULTURE -
HORTICULTURE
BACHELOR OF SCIENCE IN AGRICULTURAL EDUCATION**

COURSE CODE: CP 402

TITLE OF PAPER: CROP PHYSIOLOGY

TIME ALLOWED: TWO (2) HOURS

**INSTRUCTION: ANSWER A TOTAL OF FOUR [4] QUESTIONS.
ANSWER QUESTION ONE [1] AND ANY OTHER
THREE [3] QUESTIONS. ALL QUESTIONS CARRY
AN EQUAL NUMBER OF MARKS.**

**DO NOT OPEN THIS PAPER UNTIL PERMISSION HAS BEEN GRANTED
BY THE INVIGILATOR.**

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ANSWER QUESTION ONE [1] AND ANY OTHER
THREE [3] QUESTIONS. ALL QUESTIONS CARRY
AN EQUAL NUMBER OF MARKS.

QUESTION 1
(THIS QUESTION IS COMPULSORY)

[A]. Using one sentence only in each case, clearly differentiate between the meanings of the following pairs of terms (marks will be deducted if you use more than one sentence in each case):

- (i) Plant physiology; crop physiology; [2 marks]
 - (ii) In vivo; in vitro; [2 marks]
 - (iii) Organelle; organism; [2 marks]
 - (iv) Anabolism; catabolism; [2 marks]
 - (v) A C₃ plant; a C₄ plant. [2 marks]
- [10 marks]**

- [B]. (i) Briefly explain what is meant by parthenocarpy. [5 marks]
- (ii) Name two specific examples of natural parthenocarpy. [2.5 each x 2 marks
= [5 marks]
- [10 marks]**

[C]. You have been employed to manage a greenhouse. If you were assigned to buy a shade netting for the greenhouse, what colour of netting would you buy? Justify your answer? [5 marks]

[Total marks for question 1 = 25 marks]

QUESTION 2

2. (a) Describe one specific foliar symptom of nitrogen deficiency in maize. (3 marks).
- (b) Why does the symptom described occur in that part of the plant? (3 marks).
- (c) Describe one specific symptom of calcium deficiency in maize. (3 marks).
- (d) Explain why the symptom occurs in the part that you have specified. (3 marks).
- (e) Describe one symptom of phosphorus deficiency in maize. (3 marks).
- (f) Describe one symptom of potassium deficiency in maize. (3 marks).
- (g) Describe a deficiency symptom that may be observed from a non-vegetative part of a plant (specify the plant, plant part and the deficient nutrient) (3 marks).
- (h) Name four micronutrients that are considered to be essential to plants. (4 marks).

[Total marks for question 2 = 25 marks]

QUESTION 3

- (a) What do you understand by transpiration? (3 marks)
- (b) What do you understand by evapotranspiration? (3 marks)
- (c) Name the major avenues through which transpiration occurs in crops. (3 marks)
- (d) What is the significance of transpiration in agriculture? (3 marks).
- (e) Explain the dilemma of terrestrial plants? (3 marks)
- (f) What is guttation? (3 marks)
- (g) Give an example of when and where you might observe guttation in a named family of plants. (3 marks)
- (h) Name two structural features that enable the *Cactus* plant to conserve moisture in its environment. (4 marks)

[Total marks for question 3 = 25 marks]

QUESTION 4

- a. A farmer planted rice and maize on his farm. He harvested both crops and the following week, he planted the grains again to start a new crop. However, to his disappointment, only the grains of maize emerged but those of rice did not emerge. Identify the problem. What advice would you give to that farmer? (5 marks)
- b. You need ripe bananas for use at a wedding party. However, you only found unripe, mature bananas in the market. You have one week to make the unripe banana ready for use at the party. Explain what you would do to make the bananas ready for use at the party. (5 marks)
- c. What would be the major difference between your bananas and the ripe ones that you could have bought from the fruit market? (5 marks)
- d. A farmer has a five-year-old mango tree that does not usually flower like his neighbour's mango trees. Explain a cheap method that the farmer can use to solve this problem (5 marks)
- e. Clearly explain why tomato seeds do not usually germinate within the fruit. (5 marks)

[Total marks for question 4 = 25 marks]

QUESTION 5

- a. What do you understand by a sink in crop physiology? (3 marks)
- b. Give a specific example of a sink. (2 marks)
- c. What do you understand by a source in crop physiology? (3 marks)
- d. Give a specific example of a source. (2 marks)
- e. Explain the relationship between source, sink and senescence. (5 marks)
- f. What is skototropism? (3 marks)
- g. What is a nastic movement? (3 marks)
- h. Give a specific example of a nastic movement (2 marks)
- i. What is a clinostat used for? (2 marks)

[Total marks for question 5 = 25 marks]