GWANDA STATE UNIVERSITY

FACULTY OF LIFE SCIENCES

DEPARTMENT OF CROP SCIENCES

BACHELOR OF SCIENCE HONOURS DEGREE IN CROP SCIENCE

Crop Physiology 1

LCS2101

First Semester Final Examination Paper

Jan/Feb 2021

This examination paper consists of 4 pages

Time Allowed: **3 hours**

Total Marks: **100**

Special Requirements: **None**

Examiner's Name: **R. Mapuranga**

INSTRUCTIONS

1. This paper contains two (2) Sections (A and B) and seven (7) Questions
2. Answer **all** questions from **Section A** and **three** questions from **Section B**.
3. Start each question on a new page

MARK ALLOCATION

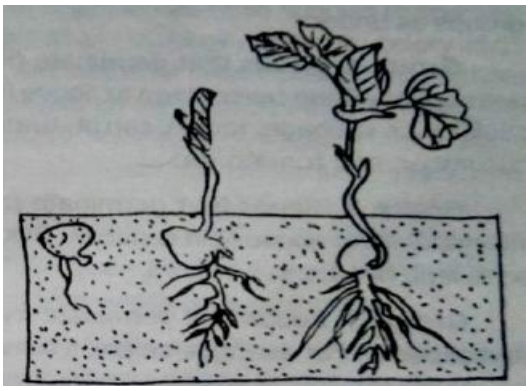
QUESTION	**MARKS**
SECTION A	**40**
SECTION B	**60**
TOTAL ATTAINABLE MARKS	**100**

Section A: Answer all questions [40 Marks]

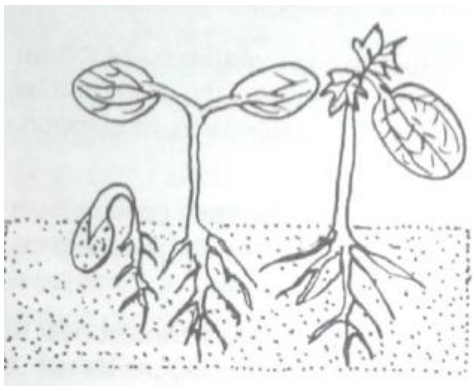
1. (a) Define the following terms as they are used in agriculture [4]
   i. Self incompatibility
   ii. Tropism
   iii. Seed
   iv. Solute potential

   (b) State the type of seed germination shown on the following diagrams M and N and give an example of one plant species for each method of germination [4]

M



N



   (c) Briefly describe any one simple experiment which led to the discovery of plant hormones [4]

   (d) With the aid of a diagram (graph), list the different phases of seed germination. State what happens during each phase [8]

2. (a) List any two differences between low fluence responses and high irradiance responses of plants to phytochrome [4]

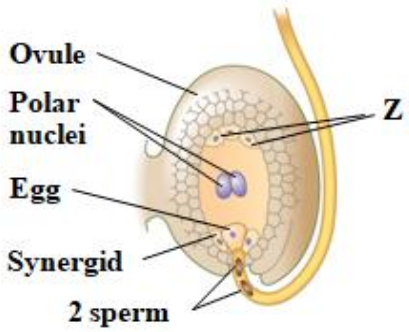
   (b) Give one example each of the following types of fruits [4]
   i. Simple fruit
   ii. Aggregate fruit
   iii. Multiple fruit
   iv. Accessory fruit

   (c) Explain how the xylem vessels are adapted for smooth flow of water from the roots to the leaves of a plant [4]

   (d) Briefly outline how each of the following strategies is used to break seed dormancy [8]
   i. Cold stratification
   ii. Warm stratification
   iii. Mechanical scarification
   iv. Chemical scarification

Section B: Answer any three questions [60 Marks]

3. (a) The following diagram shows the process of double fertilization which is about to happen in the embryo sac.



i. What name is given to the three cells labelled Z? [2]

ii. State what each of the following will become after double fertilization: Ovary, Egg and Polar nuclei [6]

(b) Discuss the three factors that affect cell water potential (Ψw) and write down the overall word equation for cell water potential in plants [12]

4. Outline the different types of plant hormones important in agriculture. Explain how each functions in plants [20]

5 (a) Identify the types of plant movements shown by plant species X and Y below [2]

Plant response X

Plant response Y

(b) Which of these two (2) plant movements in 5 (a) above would be useful for a plant which catches and digest insects as its source of nutrition. Explain why this plant response is more useful in this situation than the other. [3]

(c) Describe any other three types of plant movements (tropism or nastic movement), and explain how they help a plant survive [15]

6 (a) Define the word photoperiod [2]

(b) Discuss the classification of plant species according to their response to changes in length of day and night [18]

7. (a) State and explain any two benefits derived by plants from fungal mycorrhizal associations [4]

(b) In what way(s) does the fungal species benefit from this association [2]

(c) Discuss the following theories/concepts as they are applied in plant-water relations

i. Bulk flow [5]

ii. Cohesion-tension theory [5]

iii. Transpiration pull [4]

End Of The Examination Paper