GWANDA STATE UNIVERSITY

FACULTY OF LIFE SCIENCES

DEPARTMENT OF CROP SCIENCES

BACHELOR OF SCIENCE HONOURS DEGREE IN CROP SCIENCE

Crop Physiology 1

LCS 2101

First Semester Final Examination Paper

June 2020

This examination paper consists of 3 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 eight (8) 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 from this section **[40 Marks]**

1. Define the following terms as they are used in crop physiology
   (a) Viviparity [1]
   (b) Double fertilization [1]
   (c) Phytohormone [1]
   (d) Chemotropism [1]
2. (a) Explain how removing the apical shoot of a plant causes it to become more bushy? [2]
   (b) When people grow new plants from cuttings, they often dip the end of the cutting in rooting compound to stimulate root growth.
      i. What hormone is in the compound? [1]
      ii. How does it work? [2]
   (c) Contrast the differences between dormancy and quiescence with reference to seed germination [2]
   (d) The Venus' flytrap obtains nutrients by closing its leaves around insects and then digesting the insects. Explain why a thigmonastic movement is a more useful plant response than a thigmotropic response would be in this situation. [3]
   (e) What is water potential (**Ψ**)? List any four components of water potential [5]
3. (a) Identify the important environmental signals for flower initiation, and describe how these signals affect this process. [4]
   (b) List three features of angiosperms which prevent self-fertilization. [3]
   (c) What is vernalization? List any four advantages of vernalization. [6]
   (d) Use the following table, compare and contrast short day plants (SDP) and long day plants (LDP) [8]

	Short day plants	Long day plants
1		
2		
3		
4		

Section B [Answer any three questions]

4. (a) With the aid of a labeled diagram(s), describe the three pathways in which water can flow from the root epidermis to the endodermis [15]

   (b) Describe how opening and closing of stomata is controlled when there is abundant water supply [5]

5. (a) Discuss the importance of seed dormancy in agriculture [10]

   (b) Outline the different methods of breaking seed dormancy which can be utilized by seed technologists and agronomists [10]

6. (a) Describe an experiment which lead to the discovery of auxins as important plant growth regulators in agriculture [6]

   (b) Outline the uses of different plant growth regulators in agriculture. [14]

7. (a) Define the term photomorphogenesis. [2]

   (b) Write short notes on the three categories of plant responses to phytochrome. [9]

   (c) Describe the different phases of seed germination [9]

8. Using labeled diagrams, compare and contrast the formation of the male and female gametophytes in angiosperms, and identify the major cell types involved. [20]

******** End of Examination ********