



GWANDA STATE UNIVERSITY
FACULTY OF LIFE SCIENCES
DEPARTMENT OF CROP SCIENCE
BACHELOR OF SCIENCE HONOURS DEGREE IN CROP SCIENCE

LCS1203 PLANT BIOLOGY

SECOND SEMESTER EXAMINATION

JUNE 2023

This examination paper consists of 6 pages

Time Allowed: 3 hours.
Total Marks: 100
Special Requirements: None
Examiner's Name: Mr.J.Dube

INSTRUCTIONS

1. Answer **ALL** questions in Section A
2. Answer **TWO** questions in Section B

MARK ALLOCATION

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

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SECTION A: ANSWER ALL QUESTIONS IN SECTION A

1. The process by which generalised cells do specialise is termed:
 - a. Elongation
 - b. Differentiation
 - c. Growth
 - d. Elongation

2. Among the following plant responses which one is responsible for tendrils climbing up other plants and walls?
 - a. Geotropism
 - b. Gravitropism
 - c. Hydrotropism
 - d. Haptotrpism

3. Where are the intercalary meristems located?
 - a. Near nodes
 - b. Leaf edges
 - c. Tip of the shoot
 - d. Vascular bundles

4. The following group of crops were found at Mr Daube's field. Identify one crop which has a different photosynthetic pathway.
 - a. Sugarcane
 - b. Rice
 - c. Maize
 - d. Sorghum

5. The mutual attraction between water molecules is called:
 - a. Adhesion
 - b. Latent Heat of vaporisation
 - c. Specific heat energyCohesion

6. Water potential is defined as:
 - a. Pressure exerted on water by the cell wall which forces water to move.

- b. Availability of charged surfaces in the cell walls and within the cell system which results in reduction of water's ability to freely move.
- c. Addition of solutes onto free water.
- d. Measure of the energy status of water.

7. Among the following gases, which one is a key input during the process of photosynthesis?
- a. Oxygen
 - b. Carbon dioxide
 - c. Hydrogen
 - d. Carbon monoxide

8. In biological systems, the term osmosis involves the diffusion of:
- a. water
 - b. solutes
 - c. energy
 - d. Both A and B

9. Of the following factors which one is not a stimulus influencing the closing and opening of the stomata?
- a. Light
 - b. Temperature
 - c. Carbon dioxide
 - d. Chlorophyll-a

10. The coleoptile in grass seedling is
- a. Radicle
 - b. Plumule
 - c. Cotyledon
 - d. Sheath around emerging leaf

11. The auxins are abundantly produced in
- a. Shoot
 - b. Root
 - c. Meristematic region of shoot
 - d. Meristematic region of root

12. Draw a well-labelled plant cell and state functions of any 8 components. [20]

13. Briefly discuss the following aspects plant physiology:

- a) Cohesion-Tension theory [4]
- b) Dark reaction [4]
- c) Benefits of seed dormancy [4]
- d) Arithmetic growth [2]

SECTION B: ANSWER TWO QUESTIONS IN SECTION B

14. a) Discuss the use of artificial plant growth regulators in Agriculture. [10]

b) The polarity of water determines its distinctive properties. Outline any four such key properties. [10]

15. a) Describe the three mechanisms of seed dormancy [10]

b) What is the importance of phototropism in plant growth and development? [5]

c) State and explain the requirements for seed vernalization. [5]

16. a) As a plant biology student at a local University, your Lecturer has assigned you to carry out a germination trial test on Maize seed (*Mays zea L*) in the laboratory. Describe the procedures you shall follow in their chronological order outlining the materials and methods plus the expected results. [14]

d) Describe the elements of the acid test theory. [6]

17 a) Using diagrams, describe in detail double fertilization in plants. [8]

b) Identify and explain any three factors affecting the stimuli which controls the stomatal opening and closing in plants. [6]

c) You have been posted to Chiredzi farming areas in Masvingo Province as a new agronomist. Give a strong justification as to why you would recommend the local farmers to adopt the growing of such crops as Sugarcane and Sorghum ahead of rice. [6]

END OF EXAMINATION PAPER

