



<b>FACULTY</b>	Agriculture, Engineering and Natural Sciences		
<b>DEPARTMENT</b>	Environmental Science		
<b>SUBJECT</b>	Ecophysiology		
<b>SUBJECT CODE</b>	EBL 3752		
<b>DATE</b>	November 2021		
<b>DURATION</b>	3 Hours	<b>MARKS</b>	120

### **REGULAR EXAMINATION**

**Examiners:** Dr. E.G. Kwembeya & Dr. S. J. Eiseb (University of Namibia)

**Moderator:** Dr. L. Hart (University of Namibia)

This examination paper consists of 3 pages (including the front page)

#### ***Instructions***

- Answer ALL questions from Section A.
- Answer ANY TWO questions from Section B.
- Label all your answers appropriately and neatly.
- The use of scientific calculators in this examination is allowed.

**UNIVERSITY OF NAMIBIA EXAMINATIONS**

**Section A: Answer ALL questions from this section (60 Marks)**

**Question 1**

- (a) Explain why C4 plants are photosynthetically more efficient than C3 plants. (4)
- (b) If a C3 and a C4 plant are placed together under a bell jar in limited CO<sub>2</sub> supply, the C3 plant will be starved by the C4 plant and will die. Explain why this occurs. (2)
- (c) Briefly discuss the role of the evolution of PSII in the global distribution of higher plants. (3)

**Question 2**

Comment on the transpiration ratios and water use efficiency of C3, C4 and CAM plants. (9)

**Question 3**

- (a) Distinguish between primary metabolites and secondary metabolites. (2)
- (b) Discuss the physiological roles of terpenoids. (4)

**Question 4**

- (a) Distinguish between constitutive and induced plant defensive strategies against herbivores. (2)
- (b) Describe the events involve in the plant's hypersensitive response to pathogen attack. (4)

**Question 5**

Provide names and describe the three adaptive approaches to environmental change, as carried out by animals. (11)

**Question 6**

Differentiate between Oligotrophic and Eutrophic lakes and provide examples of animals that inhabit such lakes. (19)

**Section B: Essays Section**  
**Answer ANY TWO questions from this section (60 Marks)**

**Question 1**

Discuss plants' physiological and cellular responses to water stress.

(30)

**Question 2**

Discuss the effects of salt stress on plants and their acclimatory and adaptive physiological responses to allow growth in saline habitats.

(30)

**Question 3**

The diagram depicted below presents the three main adaptive strategies for desert animals, in relation to their size and rate of evaporation. Discuss, with examples, the adaptive strategies of the 'Evaporators'.

(30)

