



SIR ARTHUR LEWIS COMMUNITY COLLEGE
ACADEMIC YEAR (2024/2025) – SEMESTER ONE
END OF SEMESTER EXAMINATION

COURSE CODE : BIO211
COURSE TITLE : Biological Systems I
LECTURER(S) : Felix, Marie-Louise
DATE : 19th December 2024
TIME : 9 a.m. to 11:00 a.m.
DURATION : 2 Hours
STUDENT ID # : _____



GENERAL INFORMATION AND INSTRUCTIONS

- Students must sign **IN** and **OUT** on the examination class list.
- Write your ID number on the question paper.
- Answer **ALL** questions.

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Part II

Answer all questions

1. Describe glycolysis and the Krebs Cycle and explain how these metabolic pathways are linked. **10 marks**

2. A) Explain why ATP is described as the “universal energy currency”. **1 mark**
b) Describe how ATP is produced during photosynthesis. **5 marks**
c) Explain why (i) carbon-dioxide and (ii) light intensity are limiting factors for photosynthesis. **4 marks**

3. A nephron consists of distinct sections, each of which performs a specific function. Collectively, these sections ensure that urine is formed by a process of ultra-filtration, selective re-absorption and secretion.
 - (i) Distinguish between “ultra-filtration” and “selective re-absorption” in relation to urine formation. **4 marks**
 - (ii) The proximal convoluted tubule is responsible for the process of selective re-absorption. With reference to **THREE** structural features, discuss how the proximal convoluted tubule is ideally suited to this function (selective re-absorption). **6 marks.**

4.

In an experiment investigating the effects of factors which may limit photosynthesis, some leaves are exposed to two concentrations of atmospheric carbon dioxide. The photosynthetic rates of the leaves are measured at different temperatures. The results of the experiment are shown in Figure 2.

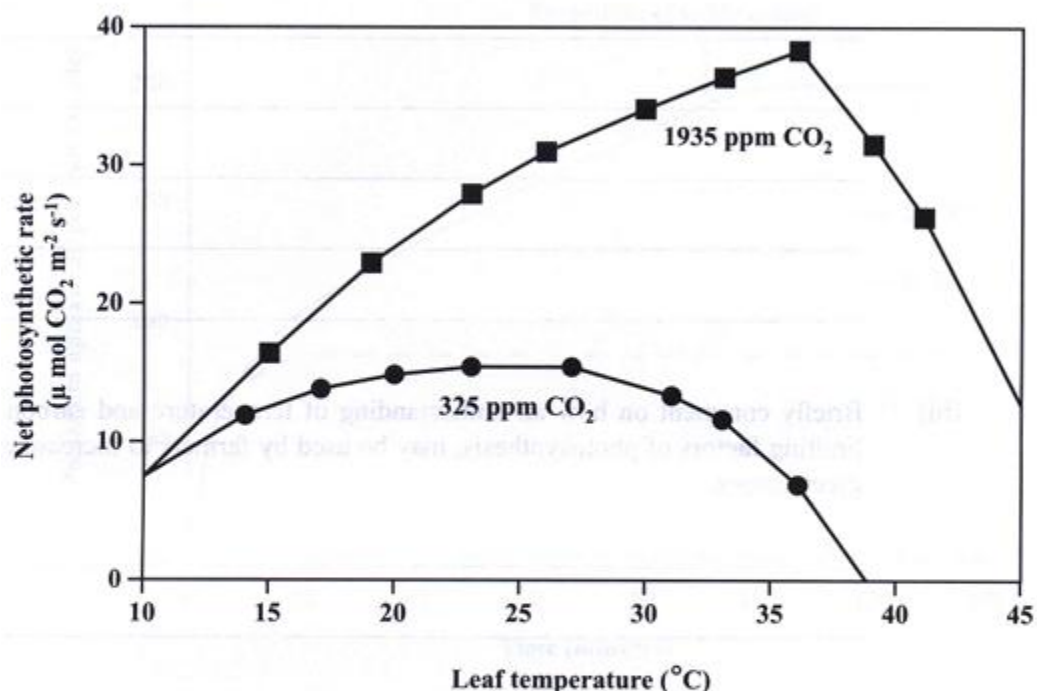


Figure 2. Effect of temperature and carbon dioxide concentration on photosynthetic rate of some leaves

http://www.friendsofscience.org/assets/documents/FOS%20Essay/Climate_Change_Science.html

- (i) Describe the relationship between leaf temperature and net photosynthetic rate at 1935 ppm CO₂.
- (ii) With reference to data presented in Figure 2, explain the effect of the increase in CO₂ concentration on the rate of photosynthesis, taking into consideration the temperature of the leaf.
- (iii) Briefly comment on how an understanding of temperature and carbon dioxide, as limiting factors of photosynthesis, may be used by farmers to increase crop yield in greenhouses.

3, 3, 4, marks