07

RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

BSc in Applied Sciences
Second Year – Semester I Examination – June/July 2022

BOT 2201– PLANT PHYSIOLOGY

Time: Two (02) hours

Answer FOUR (04) questions, including compulsory Question No. 1.

1. There is current concern that the level of CO_2 in the biosphere is increasing due to the burning of fossil fuels. If the level of atmospheric CO_2 were to double, how would the following parameters be affected? When constructing your answers, consider that the other factors are in optimum level.
   a) Rate of oxaloacetate synthesis in C4 plants.
   b) Rate of 3-phosphoglycerate synthesis in C3 plants.
   c) Rate of photorespiration in C3 plants.
   d) Yield of corn in Sri Lanka. **(100 marks)**

2. a) Explain briefly how water moves across the largely hydrophobic plasma membrane? **(30marks)**
   b) Describe how the tensions or negative pressures originating in leaves help to transport water from the roots to the top of a tree. **(40 marks)**
   c) Discuss how plants minimize the consequences of xylem cavitation? **(30 marks)**

3. a) Photosynthesis in oxygen-evolving organisms is said to involve two distinct photosystems. Describe the structure and function of these two photosystems and provide two lines of experimental evidence that led to their discovery. **(60 marks)**
   b) Explain the process of ATP synthesis at the thylakoid membranes of the chloroplasts. **(40 marks)**

4. Describe the regulation of water balance in mangroves. **(100 marks)**

5. Write short notes on the following:

   a) Physiological dormancy in seeds.

   b) Steady state and equilibrium of a plant cell.

   c) Chloroplast movement within mesophyll cells in response to light. **(3 x 35 marks)**

---END---