

八十四學年度 生命科學 所 甲 組碩士班研究生入學考試

科目 植物生理 科號 0905 共 2 頁第 1 頁 \*請在試卷【答案卷】內作答

1. 在高等植物的光合作用中，第二光系統 (Photosystem II) 能分解水產生氧氣。對此一過程我們以 S-states 的模型加以描述。請詳細說明 "S-states" 模型。(10%)
  
2. 葉綠體主要吸收可見光中那幾種顏色的光線？又它發出的螢光是什麼顏色？並請說明為什麼是這些顏色。(10%)
  
3. Please explain the following terms and indicate the relationship between the two terms in each pair if there is any (30%)
  - a. tonoplast and peroxisome
  - b. phytomer and phytoalexin
  - c. growth rate and relative growth rate
  - d. agrobacteria and nodules
  - e. cytokinin and zeatin
  - f. phytochrome and phototropism
  - g. chloroplast and proplastid
  - h. extensin and isodityrosine
  - i. apoplast and symplast
  - j. halophytes and water stress
  
4. Read each statement below carefully. Indicate whether the statement is correct or incorrect. If the statement is incorrect, please make the necessary corrections to make it correct. (10%)
  - a. Sink tissues compete for available translocated assimilates. Sink strength = sink volume x sink activity.
  - b. Phloem unloading and transport into receiver cells can only be symplastic.

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- c. The chloroplast fructose 1,6-bisphosphate phosphatase is regulated by fructose 2,6-bisphosphate.
  - d. In general an increase in fatty acid unsaturation will increase the phase transition temperature on a membrane.
  - e. Differences in self-compatibility reflect ancient events because both self-compatible and self-incompatible plants occur throughout the dicots only.
5. A farmer at Tainan has got seven varieties of sweet peas and like to select the most heat-resistant one. If the farmer has a great watering system in his farm, please design an appropriate experiment to measure temperature effects on peas in your laboratory. (10%)
  6. Please discuss the advantages and disadvantages of using plant tissue culture techniques to elucidate the role of hormones in intact plants. (10%)
  7. Trace the pathway of a water molecule from the soil to the atmosphere passing through a soybean plant. Indicate tissues in the transport pathway, the major resistance and the major driving force involved. (10%)
  8. By the use of diagrams, trace the metabolic pathway of nitrogen from the atmosphere or commercial fertilizer to its incorporation in protein and nucleic acids. (10%)