

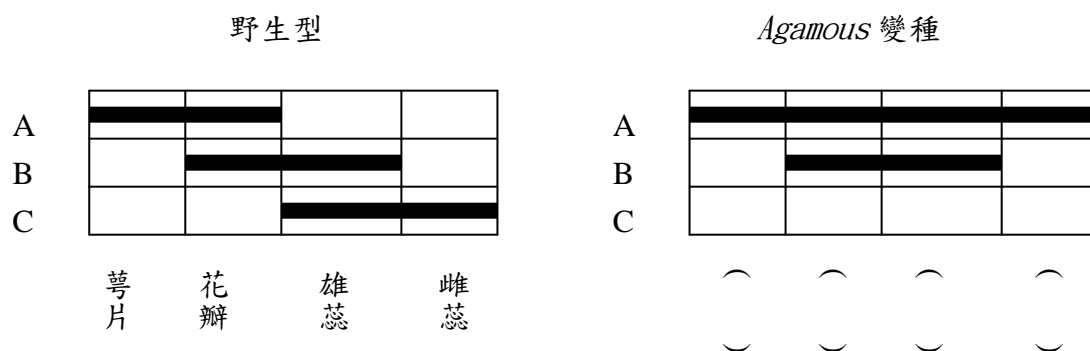
一、請解釋植物光合作用中的 C3 與 C4 途徑？(10%)

二、植物花形態發生的機制已由阿拉伯芥的研究提出 ABC 模型來解釋，根據這個模型正常花的四輪結構從外到內分別是萼片、花瓣、雄蕊、雌蕊，是由 3 類基因 (A、B、C) 組合作用而完成的，如左下圖。請問

(1) 翻譯下文

All three activity types are functional in the wild type. Loss of type A function results in the spread of C function throughout the meristem. Loss of type B function results in the expression of only A and C function. (12%)

(2) 如左下圖野生型花從外到內分別是萼片、花瓣、雄蕊、雌蕊，據此請寫出右下圖 *Agamous* 變種從外到內的花器。(12%)



三、選擇題(單選，答錯不倒扣，每題 2 分)

1. The ratio of these two hormones controls whether roots or shoots will form in tissue culture.

- A. auxin and cytokinin
- B. auxin and gibberellin
- C. cytokinin and gibberellin
- D. cytokinin and ethylene
- E. ethylene and abscisic acid

2. Natural root grafts

- A. allow exchange of dissolved sugars and other materials between two trees.
- B. are called mycorrhizae.
- C. are caused by soil bacteria.
- D. cause extensive damage to roots and the trees usually die.
- E. have only been observed in a few species.

3. Ethylene

- A. is the only hormones that is a gas.
- B. interacts with auxin in leaf abscission.
- C. promotes seed germination.
- D. is the only hormones that is a gas and interacts with auxin in leaf

abscission

E. all of the above

4. Which of the following tissues is the MOST INTERNAL in the woody plant?
- A. cork cambium
 - B. cork cells
 - C. secondary phloem
 - D. secondary xylem
 - E. vascular cambium
5. Which of the following statements is TRUE about simple and aggregate fruits?
- A. Both are the product of a single flower.
 - B. Both contain a part of the receptacle.
 - C. Simple fruits contain no part of the receptacle, but aggregate fruits do contain part.
 - D. Simple fruits are from a single flower, but aggregate fruits are from multiple flowers.
 - E. Simple fruits are fleshy at maturity, but aggregate fruits are dry at maturity.
6. _____ are underground structures that have fleshy leaves designed for storage or water or sugars.
- A. Bracts
 - B. Bud scales
 - C. Bulbs
 - D. Corms
 - E. Spines
7. _____ must be pumped out of the guard cells in order for a stoma to open.
- A. Cl^- (chloride ions)
 - B. H^+ (protons)
 - C. K^+ (potassium ions)
 - D. Water
 - E. None of these
8. The annual rings that form in trees living in the temperate part of the wood are the result of
- A. annual changes in the size of the cork cambium.
 - B. annual changes in the size of the vascular cambium.
 - C. deposition of pigments that occurs preferentially during the winter.
 - D. seasonal differences in secondary xylem growth rates.
 - E. the production of additional parenchyma cells that occurs each spring.

9. Which of the following is found in a eudicot stem, but NOT in a monocot stem?
- A. epidermis
 - B. pith
 - C. phloem
 - D. xylem
 - E. none of these
10. Lateral (branch) roots typically arise in the
- A. cortex
 - B. endodermis
 - C. epidermis
 - D. pericycle
 - E. xylem

四、 tendrils(捲鬚)及 spines(刺毛)可由莖或葉特化，請問如何判別它們是源自莖或葉？(4分)

五、 circadian rhythms(晝夜節律)及 photoperiodism(光週期性)為何對植物的存活很重要？(4分)

六、試描述水分及礦物質進入內皮細胞的路徑有何差異？(5分)

七、請比較 C3 植物、C4 植物與 CAM 植物所行光合作用之差異。(12%)

八、請說明下列各植物激素之主要功能。(15%)

植物生長素 Auxins	吉貝素 Gibberellins	細胞分裂素 Cytokinins	離層酸 Abscisic acid	乙烯 Ethylene
-----------------	---------------------	---------------------	----------------------	----------------

九、試敘述植物的光週期，及其在田間的實際運用。(6%)