

請依題號順序作答，並採橫式書寫

I. 單選題：(30分，每題3分)

- 1) Synthetic auxins are used commercially
 - A) to promote fruit ripening.
 - B) to promote seed germination.
 - C) to promote flowering in ornamental crops.
 - D) to promote side branching to produce bushier crops.
 - E) as a broadleaf weed killer.
- 2) Shoot branching is controlled mainly by the interaction of
 - A) gibberellins and cytokinins.
 - B) gibberellins and abscisic acid.
 - C) auxins and cytokinins.
 - D) auxins and gibberellins.
 - E) cytokinins and abscisic acid.
- 3) Compared to conventional agriculture, organic farming
 - A) guarantees the safety and extra health benefits of food.
 - B) requires much less hands-on work.
 - C) exposes farm workers to greater health risks.
 - D) uses fewer synthetic chemicals.
 - E) increases crop yields.
- 4) Which of the following would be a good way to ripen a green tomato?
 - A) placing it in a microwave, on low power, for 5 minutes
 - B) placing it in a sealed plastic bag with an overripe banana
 - C) placing it under a bright light for 24 hours
 - D) putting it in a darkened area such as a drawer or box
 - E) wrapping it in foil and putting it in the refrigerator
- 5) A hot, dry summer will reduce crop yields in part because
 - A) the stomata of the plants stay open to help cool the leaves.
 - B) too much carbon dioxide enters the plants when stomata are wide open.
 - C) oxygen uptake is reduced by the stomata closing to prevent excessive water loss.
 - D) carbon dioxide uptake is reduced by the stomata closing to prevent excessive water loss.
 - E) respiration is severe to cause water loss
- 6) Removing the shoot apex of a plant that shows apical dominance will cause
 - A) increased growth of the axillary buds.
 - B) increased growth of the terminal bud.
 - C) an increase in the size of the leaves.
 - D) an increase in the growth of the root system
 - E) an immediate flowering of the plant.

- 7) Which of the following is a disadvantage of cloning as a propagation technique?
- A) Cloned organisms are dangerous and unpredictable.
 - B) Cloning is more expensive and more difficult than growing from seeds.
 - C) Cloning requires more space than traditional seed propagation.
 - D) Cloning is time-consuming, with slow results.
 - E) Cloning produces monocultures that can potentially be wiped out by a single disease.
- 8) Which of the following is a potential problem associated with genetically engineered plants?
- A) Genetically engineered plants will not be able to reproduce on their own.
 - B) Disease-resistant genes from genetically engineered plants may escape into the wild.
 - C) Genetically engineered plants are typically adapted to a far narrower range of conditions than naturally arising species.
 - D) Genetically engineered plants will be less nutritious.
 - E) Genetically engineered plants will be more susceptible to viral and bacterial diseases.
- 9) The two main forces that move water through a plant are
- A) transpiration and root pressure.
 - B) root pressure and photosynthesis.
 - C) transpiration and pressure flow.
 - D) active transport and cohesion.
 - E) transpiration and translocation.
- 10) A process unique to angiosperms is
- A) syngamy
 - B) alternation of generations
 - C) seed production
 - D) double fertilization
 - E) heterospory

II. 名詞解釋，並說明其對植物生長發育的意義（30分，每題5分，僅直譯為中文不予計分）

1. Apical meristems
2. Phototropism
3. Alternation of generations
4. Totipotency
5. Secondary growth
6. Molecular breeding

III. 申論題：（40分，每題10分）

1. 從光合作用效率角度，比較為何 C₄ 及 CAM 植物比 C₃ 植物更能適應環境？
2. 過去曾有建議砍除森林內枯立倒木或老木，並將清除後的森林改種生長快的樹苗，以固定更多產生溫室效應之二氧化碳氣體，此提議是否有欠缺深思熟慮之處？
3. 人類因使用過多的含氮、含磷化學肥料栽種植物造成環境污染，請提議如何應用植物與微生物交互作用原理，來增加植物吸收營養能力？
4. 開花植物的演化為什麼能產生那樣多花朵形態及果實傳播方式多樣性？另列舉兩個花朵形態變化繁多的植物科名為例說明。