

所別：生命科學系碩士班 不分組 科目：植物生理學

一、單選題 (每題 5 分)

1. The term IMBIBITION refers to (A) water uptake by root hair (B) water uptake by dry seeds (C) ion uptake by root hair (D) symplastic movement of water in root (E) apoplastic movement of water in root.
2. Which of the following descriptions is **not** true? (A) both trichome and root hair are derived from epidermal cells (B) root hairs can help plants to absorb water (C) trichomes can cool plants by reflecting sunlight (D) both root hair and trichome are unicellular (E) Root hairs can penetrate water-containing capillary spaces between soil particles.
3. Which of the following is the most abundant protein in plant photosynthetic organs? (A) Alcohol dehydrogenase (B) Superoxide dismutase (C) Ribulose -1,5-bisphosphate carboxylase-oxygenase (D) Aldolase (E) Phosphoglycerate kinase.
4. PLASMOLYSIS happens when an onion cell is (A) bathed by a hypotonic solution (B) freezed (C) placed at high altitude (D) treated with hormone auxin (E) stained with ethidium bromide.
5. Xylem sap exudation (泌出) is considered to be the result of (A) root pressure (B) surface tension (C) transpiration (D) capillarity (E) evaporation
6. Which of the following ions is the **most common** osmotic regulator in plant cells? (A) K^+ (B) Ca^{2+} (C) Mg^{2+} (D) Al^{3+} (E) Mn^{2+} .
7. Stomatal conductance refers to (A) the electric potential across a guard cell membrane (B) the $[K^+]$ gradient across a guard cell membrane (C) the easiness of which gaseous materials pass through stomata (D) the turgor of a guard cell (E) the electric potential between a guard cell and its adjacent subsidiary cell.
8. Differentiated plant cells have the ability to undergo cell division, grow as undifferentiated callus, and eventually to give rise a new plant. This concept is known as (A) productivity potential (B) reproductive efficacy (C) totipotency (D) reproductive versatility (E) regeneration potential.

二、名詞解釋 (每題 4 分)

1. Aleurone layer
2. Circadian rhythms
3. Embryogenesis
4. Heat shock protein
5. MADS box genes
6. Polar auxin transport
7. Shoot apical meristem
8. Triple response of ethylene
9. Vivipary

三、簡答題

1. 請扼要列出 C3 植物和 C4 植物之間，其光合作用之固碳反應、固碳效能、及葉部型態解剖上的差別 (10 分)。
2. 請扼要說明 ABA 在缺水環境下調控氣孔開關的作用機制 (7 分)。
3. 請扼要說明植物荷爾蒙如何調控植物的頂芽優勢 (Apical dominance) (7 分)。

