

臺灣綜合大學系統 107 學年度學士班轉學生聯合招生考試試題

科目名稱	普通植物學	類組代碼	A05
		科目碼	A0501

※本項考試依簡章規定各考科均「不可以」使用計算機

本科試題共計 3 頁

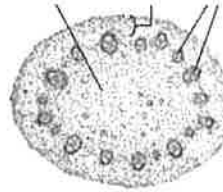
滿分 100 分

A. **Multiple Choice** 單選題 (請選出一個最適合的答案), 每題 3 分, 共 27 分

1. Which part of a plant does the right figure show?

The cross section of the (A) root. (B) stem of a monocot plant. (C) stem of a dicot plant.

(D) leaf. (E) style.



2. Which of the following is true? (A) Brown algae can't undergo photosynthesis. (B) Mosses have vascular tissues. (C) Ferns are plants with vascular tissues and seeds. (D) Pine tree has flowers. (E) Rose belongs to dicot angiosperms.
3. Which of the following is the order of events in one cell cycle? (A) Interphase → metaphase → anaphase → prophase → telophase. (B) Prophase → metaphase → anaphase → telophase. (C) Prophase → metaphase → anaphase → interphase → telophase. (D) Interphase → prophase → metaphase → anaphase → telophase. (E) Interphase → prophase → anaphase → telophase.
4. In a plant leaf, the majority of photosynthesis occurs in the: (A) upper epidermis. (B) palisade parenchyma. (C) bundle sheath parenchyma. (D) spongy mesophyll. (E) lower epidermis.
5. Which of the following is **NOT** a difference between aerobic respiration and photosynthesis? (A) Function of the electron transport chain. (B) Site of the process. (C) Energy source for phosphorylation. (D) General type of redox process. (E) Role of O₂.
6. Just after the sun rises, the initial event that leads to the opening of stomatal pores is the: (A) diffusion of water into guard cells from adjacent cells. (B) diffusion of water out of guard cells into adjacent cells. (C) active transport of K⁺ into guard cells from adjacent cells, lowering the water potential. (D) diffusion of K⁺ into guard cells from adjacent cells, lowering the water potential. (E) synthesis of glucose, lowering the water potential in the guard cells.
7. The conversion of N₂ into ammonia is called: (A) nitrogen reduction. (B) nitrate reduction. (C) nitrogen assimilation. (D) denitrification. (E) nitrogen fixation.
8. Flowers of night-blooming (開花) cereus (仙人掌) are open at night and close during the day. This is an example of a: (A) positive phototropic response. (B) negative phototropic response. (C) photomorphogenic response. (D) photonastic response. (E) positive phototaxis response.
9. Which of the following hormone and the response that it elicits (引出) are **NOT** matched? (A) Salicylic acid; Resistance to pathogens. (B) Cytokinin; Flower Senescence. (C) Auxin; Apical dominance. (D) Abscisic acid; Stomatal closure. (E) Ethylene; Fruit abscission.

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<p>B. Multiple Choice 單選題 (請選出一個最適合的答案), 每題 6 分, 共 36 分</p> <ol style="list-style-type: none"> Which of the following about cell membrane is NOT true? (A) Biological membranes are composed of proteins and two layers of phospholipid molecules. (B) The membrane is actually a heterogeneous (異質的) liquid containing a number of proteins. (C) The lipid layer of a biological membrane doubles over to make a bilayer in which the fatty acids make contact with the water and the phosphate groups are away from water. (D) Membranes are selectively permeable, which allows for compartmentalization (區隔). (E) A vesicle fused to the cell membrane, releasing its contents to the exterior (外部) of the cell is called exocytosis. Which of the following about root is NOT true? (A) The waterproof casparian strip of the root endodermis forces any minerals that are moving through the apoplast of the plant to either be accepted by the plasma membrane of the epidermis and thereby move to the xylem or be stopped from entering the vascular tissue. (B) The primary roles of the root cap are to protect the apical meristem and detect gravity. (C) Mycorrhizal roots increase phosphorus absorption. (D) Starting from the tip, the root zones are: Root cap → apical meristem → zone of maturation/root hairs → zone of elongation. (E) If a water molecule entered a mature root at the root surface, it would cross the following tissues, in their correct order, on its way to the center: Epidermis, cortex, endodermis, pericycle, phloem, xylem. Which of the following about photosynthesis is NOT true? (A) To promote plant growth, lights called <i>grow lights</i> should produce light enriched in red and blue. (B) Photosystem I and photosystem II must be connected for the formation of NADH. (C) A major function of photosystem II is to reduce P700, replenishing (補充) electrons lost in photosystem I. (D) In C₄ metabolism, mesophyll cells contain the enzyme PEP carboxylase, which has a high affinity for carbon dioxide. (E) The generation of ATP in light reaction of photosynthesis is through chemiosmotic phosphorylation. Which of the following about respiration is NOT true? (A) Plants construct (建構) all 20 amino acids required for protein synthesis from intermediates (中間物) of respiration; no external supply of amino acids is needed. (B) The net ATP gain to a cell from glycolysis is two molecules. (C) In flooded environments, anaerobic respiration allows roots to access the energy stored in carbohydrates. (D) In the final step of the citric acid cycle, the electron acceptor molecule oxaloacetate is formed and then reused in the earlier steps of this cycle when it receives an acetyl group from acetyl CoA. (E) Thermogenic respiration is sensitive to cyanide. Which of the following is true? (A) The contents of the phloem are under pressure and the contents of the xylem are under tension. (B) Sieve tube members are empty, dead cells. (C) Vessel element protoplasm is unique (獨特的) because the vacuolar membrane disintegrates (碎裂、瓦解), allowing vacuolar water to mix with the cytosol. (D) Phloem sap movement is driven by the atmospheric water potential. (E) Phloem sap moves only short distances, whereas xylem sap moves long distances. 			

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6. Which of the following is **NOT** true? (A) According to the ABC model of flower part organization, a combination of B and C genes produces sepals. (B) Vines exhibit a positive thigmotropic response if they encounter (遇到) a fence (圍籬) post. (C) If you want to produce a shrub (灌木) with more branches, you should pinch off (捏斷) the stem tips. (D) The ability of sperm cells to swim toward egg cells is due to taxis, a response in which a cell swims away or toward a stimulus. (E) In order to cause perception and response of a stimulus; in some cases, a minimum threshold must be present during the presentation time.

C. Essay 問答題，共 37 分

1. Explain the following terms 解釋名詞 (每題 4 分，共 12 分)

- (1) test cross
- (2) phytochrome
- (3) phylogeny

2. Mutation is one of the factors that cause the gene pool to change, what are the other three factors? What is point mutation? What is somatic mutation? (10 分)

3. Diagram (畫圖說明) the life cycle of a flowering plant. (15 分)