國　立　宜　蘭　大　學

105 學年度轉學招生考試

（考生填寫）
准考證號碼：

植　物　學　試　題

《作答注意事項》

1.請先檢查准考證號碼、座位號碼及答案卷號碼是否相符。

2.考試時間：80 分鐘。

3.本試卷共有 選擇、解釋名詞及問答題，配分於試卷上，共計 100 分。

4.請將答案寫在答案卷上（於本試題上作答者，不予計分）。

5.考試中禁止使用手機或其他通信設備。

6.考試後，請將試題卷及答案卷一併繳交。

7.本試卷採雙面影印，請勿漏答。

8.應試時不得使用電子計算機。

一、選擇題(單選，每題 2 分)

1. The concentration of iodine ions in cells of seaweeds or kelps can be up to 30,000 times higher than in seawater. This is due to (A) Diffusion (B) Facilitated diffusion (C) Formation of vesicles (D) Active transport (E) All of the above

2. Cells that have a nucleus, are colorless, and are surrounded by a chitin-containing cell wall are (A) Root cells (B) Fungal cells (C) Interior stem cells (D) Fruit cells (E) Flower cells

3. In onion cells, the diploid number of chromosomes is 16. How many chromosomes are present in a cell in mid-anaphase? (A) 4 (B) 8 (C) 16 (D) 32 (E) 64

4. If all of the fruits (seeds) on the outside of a strawberry are removed when it is young, it will not develop. If the strawberry is sprayed with a hormone solution, normal development occurs. The hormone most likely to cause a response is (A) Cytokinin (B) Gibberellin (C) Ethylene (D) Auxin (E) Abscisic acid

5. Which of the following would be most likely to develop deficiency symptoms?
(A) A plant growing in a tropical rainforest with associated mycorrhizae
(B) Cacti growing in the desert
(C) A plant growing naturally on serpentine soil
(D) An aquatic plant growing in lake sediments
(E) A crop plant growing in a field that has been cultivated for many years

6. If a leaf is cut off of an African violet plant and placed in water, new roots form at the base of the petiole. The first root formed this way is (A) A taproot (B) Adventitious (C) A radicle (D) A lateral root (E) None of the above

7. Carrots and sweet potatoes are roots that have secondary growth. We find these roots easy to eat because most of that secondary tissue consists of (A) Cork (B) Phelloderm (C) Parenchyma (D) Phloem (E) Pericycle

8. Coconut milk and meat are the result of one sperm fusing with (A) Polar nuclei (B) An antipodal cell (C) A synergid cell (D) A syntipodal cell (E) An egg

9. Wind pollinated flowers usually are or have (A) Large in size (B) Zygomorphic (C) Complete flowers (D) Bright and colorful (E) Stigmas with a large surface area

10. The main advantage of Kranz anatomy is that
(A) RuBP carboxylase is found only in bundle sheath chloroplasts
(B) RuBP carboxylase is found only in palisade parenchyma chloroplasts
(C) RuBP carboxylase is found only in spongy mesophyll chloroplasts
(D) RuBP carboxylase is found only in mesophyll chloroplasts
(E) PEP carboxylase is found only in bundle sheath chloroplasts

11. Just after the sun rises, the initial event that leads to the opening of stomatal pores is
(A) The diffusion of water into guard cells from adjacent cells
(B) The diffusion of water out of guard cells into adjacent cells
(C) The synthesis of glucose, lowering the water potential in the guard cells
(D) The diffusion of K^+ into guard cells from adjacent cells, lowering the water potential
(E) The active transport of K^+ into guard cells from adjacent cells, lowering the water potential

背面尚有試題

12. From an energy-conservation standpoint, the most favorable form of nitrogen for a plant is (A) NO_3^- (B) NO_2^- (C) NH_4^+ (D) N_2 (E) All are equally favorable

13. If you know in advance that a field will be temporarily flooded, an application of what hormone might help the plants survive? (A) Abscisic acid (B) Ethylene (C) Auxin (D) Cytokinin (E) Gibberellin

14. If a normal body cell of a plant contains 5 picograms of DNA, then that cell at the end of prophase of mitosis contains (A) 2.5 picograms (B) 5 picograms (C) 10 picograms (D) 15 picograms (E) 20 picograms

15. Pericycle cells are
(A) Parenchyma cells that control mineral absorption
(B) Parenchyma cells that divide to form lateral roots
(C) Fibers that give support
(D) Endodermal cells that control mineral absorption
(E) a and b

二、解釋名詞(每題 2 分)

1. symplast and apoplast

2. major elements and trace elements

3. prop roots and contractile roots

4. angiosperm and gymnosperm

5. genetic engineering of plants and tissue culture of plants

三、問答題(每題 10 分)

1. 何謂作物春化作用(vernalization)?對生產栽培有何益處?

2. 在合適的環境，甲藻(dinoflagellates)快速繁殖造成海水呈現不同顏色，稱之?它們如何危害魚及人類?

3. 菌根菌(mycorrhizae)、根瘤(root nodules)及吸根(haustoria)都有 2 種生物體，請問每一種各具有哪 2 種生物體?彼此的影響如何?

4. 試說明「ABC 模型(ABC model)」調控被子植物(angiosperms)花部器官發育機制?

5. 草莓利用走莖(stolon)及種子繁殖的優缺點各為何?

6. 至少有一番茄變種可以用海水澆灌栽培。育成此變種的番茄植株生理上需有哪些適應性改變?若長期栽培此變種番茄會有那些問題?