※ 注意：請於試卷上「非選擇題作答區」依序作答，並應註明作答之部份及題號。

Ⅰ. 解釋名詞：(每題 4 分，共 40 分)

1. whiplash flagellum and tinsel flagellum
2. homothallic and heterothallic; monoecious and heteroecious
3. oogonium and carpogonium; antheridium and spermatangium
4. dikaryotic, monokaryotic and diploid
5. plasmogamy and karyogamy; isogamy and heterogamy
6. dermal tissue system; ground tissue system; vascular tissue system
7. stoma; hydathode; lenticel
8. pollination; double fertilization; embryogenesis
9. epigean germination; hypogean germination
10. lichen; mycorrhizae; root nodule

Ⅱ 問答題: (每題 10 分，共 30 分)

1. Based on the ultrastructure of chloroplasts and content of pigments in different groups of algae and land plants, please give the most possible evolutionary pathway to show their relationship.
2. Which of the bryophytes has the most highly developed sporophyte? Which has the most highly developed gametophyte? Please draw them and give reasons for each case.
3. Describe the detailed life cycle of *Puccinia graminis* and give the chromosome set for each stage.

Ⅲ 問答題: (每題 6 分，共 30 分)

1. A major factor in life on land is coping with ultraviolet radiation from the sun. Early in the evolution of land plants, there was a change from having a prominent haploid gametophyte to a prominent diploid sporophyte. Explain when and why this change may have occurred in reference to ultraviolet radiation.
2. What is paleobotany? Explain why the sporopollenin and lignin are largely responsible for the formation of most plant fossils, and where do these compounds occur in plants?
3. Discuss several reproductive and survival advantages of seeds over spores. Describe the two major stages in the evolution of seeds.
4. Discuss the need for a plant to maintain a balance between its shoot and root systems even under the diverse environmental conditions.
5. Diagram and label the components of each of the followings in the typical gymnosperm and angiosperm: an ovule with a mature megagametophyte, a mature microgametophyte, and a mature seed.

試題隨卷繳回