

1. Describe double fertilization process and indicate its role on plant embryogenesis (e.g. the forming of endosperm, the fertilization of zygote). In addition, except from *Ephedra* and *Gnetum*, do other gymnosperm follow double fertilization as well? If not, what is the major difference between gymnosperm and angiosperm fertilization process? (10%)
2. What kinds of structure help plants to adapt on land compared to their relatives growing in water (e.g. water transport, prevention of water loss, air exchange, etc.)? You should also indicate function of these structures. (10%)
3. Flower evolution is highly related to pollination. Briefly describe flower's major pollination modes we observe nowadays (e.g. pollination facilitated by physical force, biotic force, etc.). Moreover, give examples on how flower develops specialized structure to promote pollination among each mode. (10%)
4. Traditional plant taxonomy nowadays has been challenged by molecular phylogeny studies and evolutionary developmental (evo-devo) considerations. What do you think the best way to resolve the conflict if results are different from traditional morphology treatments and suggested molecular evidence? (e.g. shall we identify species based on phylogeny results or recognitions from local flora?) (10%)
5. What are seedless vascular plants? As they usually dwell on moist and shade forest floor, they are good indicators for environmental change. Give examples of species on each of four seedless vascular plants phyla. (10%)
6. Describe noncyclic and cyclic electron flow and photophosphorylation in photosynthesis. What products are produced by each? Why is cyclic electron flow essential to the Calvin cycle? (10%)
7. Describe structurally and functionally of the following structures: actin filaments, microtubules, peroxisome, and kinetochore. (10%)
8. In the typical cell cycle there are checkpoints. What are these checkpoints? What purpose do they serve? (10%)
9. Compare auxin and cytokines in each of the following: principle sites of biosynthesis; polarity of transport; cell types or tissue involved in transport; effect on cell division; effect on the production of roots and shoots in tissue cultures. (10%)
10. Explain what is meant by cytoplasmic inheritance? (5%)
11. Describe the relationship of phytochrome, flowering, red light, and far-red light. (5 %)