

一、問答題（每題 10 分）

1. Please give examples to describe 4 different methods that a cell uses to transport substances from the extracellular environment.
2. How many stages of photosynthesis? Please give them a concept description.
3. DNA is the genetic material today and it is more stable than RNA. But during the development of early life, RNA was considered to be the first genetic material, why?
4. Compare the structure of a planarian (a flatworm) and an earthworm with regard to the following: digestive tract, body cavity, and segmentation.
5. What are the advantages and disadvantages of sexual reproduction?
6. What is biodiversity (biological diversity)? Describe the values of biodiversity.
7. State five conditions that limit the Hardy-Weinberg principle.

二、選擇題（每題 2 分）

1. Imagine that you are a paleontologist (a scientist that studies fossils of ancient life forms). In a recent dig, you unearthed bones of all of the following. Which could you have found in the oldest sediments?
 - a. amphibians
 - b. mammals
 - c. reptiles
 - d. birds
 - e. humans
2. In contrast to the traditional grouping of reptiles, cladistic analysis indicates that Reptilia is not a monophyletic group and that
 - a. birds are more closely related to crocodiles than either is to turtles.
 - b. mammals are more closely related to birds than birds are to dinosaurs.
 - c. dinosaurs are more closely related to lizards than to birds.
 - d. mammals are more closely related to dinosaurs than are lizards.
 - e. turtles gave rise to both birds and mammals.
3. The animal phylum that is most like the protists that gave rise to the animals is
 - a. Echinodermata.
 - b. Cnidaria.
 - c. Ctenophora.
 - d. Porifera.
 - e. Lycophyta.

4. Which of the following is thought to be most closely related to humans?
- a. sea star
 - b. snail
 - c. earthworm
 - d. jellyfish
 - e. ant
5. Which of the following is associated with bilateral symmetry?
- a. a sessile lifestyle
 - b. a lack of true tissues
 - c. all bilaterally symmetrical animals are parazoans
 - d. none have a mesoderm
 - e. cephalization
6. Coeloms
- a. evolved independently more than once.
 - b. characterize animals with a solid body.
 - c. are found in all animals.
 - d. are called gastrovascular cavities when present in cnidarians.
 - e. are completely lined by tissue derived from endoderm.
7. Which of the following is not a difference between protostomes and deuterostomes?
- a. the presence of a body cavity
 - b. Protostomes are schizocoelous and deuterostomes are enterocoelous.
 - c. the fate of the blastopore
 - d. the cleavage plane of the embryo
 - e. the timing of determination of embryonic cells.
8. Which of the following is a difference between plants and fungi?
- a. Plants have diploid and haploid phases, and fungi only have haploid stages.
 - b. Fungi have cell walls.
 - c. Fungi are heterotrophic and plants are autotrophic.
 - d. Plants produce spores.
 - e. Fungi are strictly asexual and plants undergo sexual reproduction.
9. Lichens are
- a. a mutualistic association of fungi and plant roots.
 - b. predatory fungi.
 - c. the sexual stage of deuteromycetes.
 - d. a symbiotic association of photosynthesizers and fungi.
 - e. used to produce blue cheese.

10. Conifers usually

- a. bear cones that produce both microspores and megaspores.
- b. have pollen that is transported by water.
- c. bear flowers.
- d. bear both male and female cones on the same tree.
- e. shed their leaves in the fall.

11. Angiosperms are different from all other plants because only they have

- a. a vascular system.
- b. flowers.
- c. a life cycle that involves alternation of generations.
- d. seeds.
- e. a sporophyte phase.

12. Which of the following produces eggs and sperm?

- a. the fruiting bodies of a fungus
- b. fern sporophytes
- c. moss gametophytes
- d. the anthers of a flower
- e. moss sporangia

13. In general, how do algae and protozoans differ?

- a. Protozoans can move, and algae cannot.
- b. Algae are free-living, and protozoans are parasitic.
- c. Protozoans are autotrophic, and algae are heterotrophic.
- d. Algae are photosynthetic, and almost all protozoans are heterotrophic.
- e. Algae are prokaryotes, and protozoans are eukaryotes.

14. Which of the following organisms forms gametes at some stage in their life cycle?

- a. Plasmodium
- b. a cellular slime mold
- c. Paramecium
- d. Stentor can reproduce asexually (cell division) or sexually by conjugation.
- e. Both a and b

15. Alternation of generations is seen in the life cycle of

- a. Stentor.
- b. amoeba.
- c. Laminaria.
- d. cyanobacteria.
- e. Euglena.