Chapter 30 Plant Diversity II: The Evolution of Seed Plants

1) Fruits have contributed to the success of angiosperms by
   A) nourishing the plants that make them.
   B) facilitating dispersal of seeds by wind and animals.
   C) attracting insects to the pollen inside.
   D) producing sperm and eggs inside a protective coat.
   E) producing triploid cells via double fertilization.

2) Which of the following INCORRECTLY pairs a sporophyte embryo with its food source?
   A) pine embryo; female gametophyte tissue in nucellus
   B) grass embryo; *3n* endosperm tissue in seed
   C) moss embryo; female sporophyte tissue
   D) fern embryo; photosynthetic gametophyte
   E) club moss embryo; subterranean, nonphotosynthetic gametophyte

3) Angiosperms are the most successful terrestrial plants. This success is due to all of the following
EXCEPT
   A) animal pollina tion.
   B) reduced gametophytes.
   C) fruits enclosing seeds.
   D) xylem with vessels.
   E) sperm cells with flagella.

4) All of the following plant structures are adaptations specifically for a terrestrial environment EXCEPT
   A) roots.
   B) xylem.
   C) cell walls.
   D) waxy cuticle.
   E) seeds.

5) All of the following are characteristic of angiosperms EXCEPT
   A) coevolution with animal pollinators.
   B) double internal fertilization.
   C) free-living gametophytes.
   D) pistils.
   E) fruit.

6) Which of the following is TRUE concerning the sporophyte and gametophyte generations in "flowering plants?
   A) All of the below are true.
   B) The sporophyte generation is dominant.
   e) The sporophyte generation is what we see when observing a plant.
   D) Unlike ferns, the gametophyte generation is not photosynthetic.
   E) The gametophyte generation is relatively few cells in the flower.

7) Along with the seed, the seed plants have evolved several additional adaptations to the land environment. Which one of the following is NOT such an adaptation?
   A) Flagella ted gametes are not required for seed forma tion.
   B) The female gametophyte is protected from desiccation by the surrounding tissues of the sporophyte.
   e) The seed and/ or associated structures serve as a means of dispersal.
   D) Seed formation introduces a new type of genetic recombination.
   E) The seed contains nutrients for the enclosed embryo.

8) A land plant produces flagellated sperm and has a dominant diploid generation. The plant is probably a
   A) moss.
   B) green alga.
   e) fern.
   C) conifer.
   D) flowering plant.

The following questions refer to the generalized life cycle for plants shown in Figure 30.1. Each number within acircle or square represents a specific plant or plant part, and each number over an arrow represents either meiosis, mitosis, or fertilization.

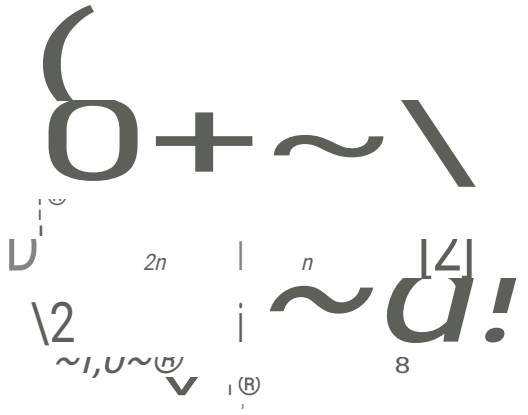

Figure 30.1

9) A moss gametophyte is represented by
A) I.
B) 3.
C) 5.
D) 7.
E) II.

10) Which number represents the embryo sac of an angiosperm flower?
A) 1
B) 3
C) 7
D)9
E) 11

11) Meiosis is represented by
A) 2 only.
B) 3 only.
C) 4 only.
D) 8 only.
E) both 4 and 8.

12) Which number is a megaspore mother cell?
A) 1
B) 3
C) 5
D)7
E) 11

13) In flowering plants, meiosis occurs specifically in the
A) megaspore mother cells.
B) micros pore mother cells.
C) endosperm.
D) Only A and B are correct.
E) A, B, and C are correct.

14) Danger of desiccation and the need for gas exchange are two conflicting problems that were partially
solved through the evolution of
A) phloem.
B) stomates.
C) cuticle.
D) Only Band C are correct.
E) A, B, and C are correct.

15) Which of the following represents the male gametophyte of an antiosperm?
A) ovule
B) micropspore mother cell
C) pollen
D) embryo sac
E) fertilized egg

Use the following choices to identify the phrases for the questions below.

A. Bryophyta
B. Pterophyta
C. Coniferophyta
D. Anthophyta
E. Hepatophyta

16) dominant sporophyte, small gametophyte, swimming sperm

17) nonmotile sperm, both wind and insect pollinated

18) endosperm, xylem vessels, and fruit

19) flattened thallus, dominant gametophyte, motile sperm

20) needlelike leaves, "naked" seeds, nonmotile sperm

21) A botanist discovers a new species of plant with a dominant sporophyte, chlorophyll *a* and *b,* and a cell wall made of cellulose. In assigning this plant to a division, all of the following would provide useful information EXCEPT whether or not the plant has
A) endosperm.
B) seeds.
C) flagellated sperm.
D) flowers.
E) starch.

22) Plants with a dominant sporophyte are successful on land because
A) having no stomata, they lose less water.
B) they all disperse by means of seeds.
C) diploid plants are protected from the effects of mutation.
D) their gametophytes are all parasitic on the sporophytes.
E) eggs and sperm need not be produced.

23) Larch trees are conifers that lose their leaves each fall; from this information, what can be concluded?
A) Not all conifers are evergreens.
B) Larch trees live where winters are dry.
C) Larch trees have been classified incorrectly.
D) Larch trees live where the growing season is long.
E) Larch trees are not as well-adapted as pines.

24) Conifers are noted for all of the following EXCEPT
A) size.
B) longevity.
C) utility to humans.
D) great diversity of species.
E) success in cold climates.

25) All of the following statements correctly describe portions of the pine life cycle EXCEPT:
A) Female gametophytes have archegonia.
B) Seeds are produced in ovulate cones.
C) Meiosis occurs in sporangia.
D) Pollen grains are male gametophytes.
E) Pollination and fertilization are the same process.

26) Gymnosperms differ from ferns in that gymnosperms
A) produce seeds.
B) have macrophylls.
C) have pollen.
D) Only A and C are correct.
E) A, B, and C are correct.

27) All of the following are valid arguments for preserving tropical forests EXCEPT:
A) People in the tropics do not need more agricultural land.
B) Many organisms are becoming extinct.
C) Plants that are possible sources of medicines are being lost.
D) Plants that could be developed into new crops are being lost.
E) Clearing land for agriculture results in soil destruction.

28) Assume a botanist was visiting a tropical region for the purpose of discovering plants with medicinal properties. All of the following might be ways of identifying potentially useful plants EXCEPT
A) observing which plants sick animals seek out.
B) observing which plants are the most used food plants.
C) observing which plants animals do not eat.
D) collecting plants and subjecting them to chemical analysis.
E) asking local people which plants they use as medicine.

29) In addition to seeds, which of the following characteristics are unique to the seed-producing land plants?
A) a haploid gametophyte retained within tissues of the diploid sporophyte
B) lignin present in cell walls
C) pollen
D) Only A and C are correct.
E) A, B, and C are correct.

30) One of the major functions of double fertilization in angiosperms is to
A) decrease the potential for mutation by insulating the embryo with other cells.
B) increase the number of fertilization events and offspring produced.
C) promote diversity in flower shape and color.
D) coordinate developmental timing between the embryo and its food stores.
E) emphasize embryonic survival by increasing embryo size.

31) Agricultural modifications of plants have progressed to the point that a number of cultivated plant
species probably could not survive in the wild. Why is this so?
A) Environmental conditions have changed since the plants evolved.
B) Seeds can be obtained only from seed banks in agricultural countries.
C) Cultivated plants are more vulnerable to human-caused pollution and disasters.
D) Special conditions not found in nature are needed for their growth and reproduction.
E) Their seeds cannot be dispersed without agricultural machinery.

32) In seed plants, which structure evolved into a pollen grain?
A) sporophyll
B) male gametophyte
C) sporopollenin
D) stigma
E) Both Band C contribute to the structure of the pollen grain.

33) All of the following are advantages of seeds EXCEPT
A) a choice of germina tion loca tion.
B) dispersal.
C) dormancy.
D) a nutrient supply for the embryo.

34) Which of the following is an ongoing trend in the history of land plants?
A) a decrease in the size of the leaf
B) the reduction of the gametophyte phase of the life cycle
C) the elimination of sperm cells or sperm nuclei
D) avoiding being eaten by dinosaurs
E) the replacement of roots by rhizomes

35) What is the main way that pine trees disperse their offspring?
A) by fruits tha tare ea ten by animals
B) by spores
C) by squirrels burying cones
D) by wind blowing seeds

36) Which of the following terms is equivalent to fertilization in pine trees?
A) spore dispersal
B) fruit formation
C) pollination
D) fusion of gametes

37) Which of the following flower parts develops into a seed after fertiliza tion?
A) ovule (= embryo sac)
B) ovary
C) fruit
D) style
E) stamen

38) Which of the following flower parts develops into a fruit after pollination?
A) stigma
B) style
C) ovule
D) ovary
E) receptacle

39) Which is NOT an advantage of fruits in various kinds of flowering plants?
A) seed dispersal by sticking to animals
B) seed dispersal by being eaten by animals
C) seed dispersal by wind
D) seed dispersal by water
E) seed consumption by seed predators

40) Which statement is FALSE about flowering plants relative to a generalized heterosporous plant?
A) In flowering plants, the megaspore is retained within the mega sporangium.
B) Flowering plants have diversified and transformed the atmosphere and climate.
C) Flowering plants have been the primary source of food for humans over many thousands of years.
D) Flowering plants attract animals and use them to carry pollen.
E) Flowering plant diversity is a readily renewable resource.

41) Which of the following is a FALSE statement about agriculture?
A) The invention of agriculture occurred about 10,000 years ago in Asia, Europe, and the Americas.
B) Domesticating plants and animals is a sort of crude genetic engineering.
C) Most people depend on a wide variety of plants as the basis for their diets.
D) Almost all domesticated plants are angiosperms.
E) Humans eat leaves, seeds, fruits, flowers, and roots of agricultural plants.

42) In the pine life cycle,
A) cones are short stems with spore-bearing, leaflike structures.
B) the pine tree is a sporophyte.
C) male and female gametophytes come together for fertilization.
D) pollen grains are very different from pine male gametophytes.
E) pine trees have a simpler vascular tissue than flowering plants.

43) Which of the following statements is FALSE?
A) A female pine cone is a short stem with spore-bearing appendages.
B) A male pine cone is a short stem with spore-bearing appendages.
C) A flower is a short stem with spore-bearing appendages.
D) None of the above are false statements.