

選擇題（共 40 題，每題 2.5 分，單選） 請於答案卷「選擇題作答區」依題號作答。

1. Plants are photoautotrophs because they ____.
 - A. make sugar by using organic raw materials
 - B. produce organic molecules from inorganic molecules
 - C. eat other organisms that use light energy to make food molecules
 - D. are only found on areas with high sunlight

2. O₂ of photosynthesis comes from ____.
 - A. water
 - B. glucose
 - C. CO₂
 - D. chlorophyll

3. Which of the following are produced during the light reactions of photosynthesis?
 - A. glucose, ADP, NADP⁺
 - B. glucose, ADP, NADP⁺, CO₂
 - C. ADP, NADP⁺, O₂
 - D. ATP, NADPH, O₂

4. CAM plants
 - A. close their stomata at night.
 - B. make a three-carbon compound used as a CO₂ source.
 - C. can be grown in Taiwan.
 - D. have adapted to very wet climates.

5. Which about plant hormones is incorrect?
 - A. They bind to specific receptors to trigger signaling transduction pathways.
 - B. Applications of higher amount of hormones will result in more extensive response.
 - C. They are involved in many aspects of plant growth and development.
 - D. Some of them can also have biological effect on animals.

6. Fruit that forms on an unpollinated plant in response to ____ will lack ____.
 - A. cytokinins, carpels
 - B. cytokinins, seeds
 - C. gibberellins, carpels
 - D. gibberellins, seeds

7. Banana fruits become soft is due to the effect of ____.
 - A. cytokinins
 - B. ethylene
 - C. gibberellins
 - D. auxins

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8. Which of the following growth responses causes the shoots of a plant grown in the dark to grow upward?
- A. phototropism
 - B. thigmotropism
 - C. gravitropism
 - D. photoperiod
9. Salicylic acid
- A. is a unique amino acid with insecticide properties.
 - B. is involved in plant defense mechanisms against microbial pathogens.
 - C. is a weed killing substance.
 - D. is involved in pH adjustment in plant cells.
10. Christmas cactus is a short-day plant that usually blooms in the winter. How can farmers induce it to bloom for the 4th of July?
- A. putting it in the cold basement every night during the early summer
 - B. putting it in a cool, well-lighted place from time to time during June
 - C. leaving it in a dark closet all night and part of each morning during June
 - D. putting it in a dark closet for a short time every afternoon during June
11. Circadian rhythms persist with periods of ____ even in the absence of environmental cues
- A. 24 hours
 - B. one month
 - C. one season
 - D. one year
12. Phytochromes are involved in ____.
- A. phototropism
 - B. photoperiod
 - C. thigmotropism
 - D. gravitropism
13. Aphids are insects who feed on ____ of plants.
- A. root exudate
 - B. phloem sap
 - C. leaf exudate
 - D. fruit
14. Mitosis does not allow organisms to ____.
- A. grow
 - B. repair
 - C. reproduce
 - D. generate genetic diversity

15. When a rose with red flowers (RR) is pollinated with pollens from another plant of the same species with white flowers (rr), the progeny will produce ____ flowers if R is a recessive allele
- red
 - pink
 - white
 - none of above
16. Continued from question #15, the progeny will produce ____ flowers if R is an incomplete dominant allele
- red
 - pink
 - white
 - none of above
17. Which of the following statements regarding genotypes and phenotypes is false?
- The genetic makeup of an organism constitutes its genotype.
 - An organism with two different alleles for a single trait is said to be heterozygous for that trait.
 - An allele that is fully expressed is referred to as recessive.
 - The expressed physical traits of an organism are called its phenotype.
18. A testcross is a mating between an individual of ____ and an individual ____ for the trait of interest
- unknown genotype, homozygous recessive
 - unknown genotype, heterozygous
 - unknown genotype, homozygous dominant
 - heterozygous, homozygous recessive
19. *Rhizobium* spp.
- are important phosphate-fixers.
 - can form nodules on any organs of plants.
 - only infect legumes.
 - are symbiotic fungi.
20. Mutualistic relationships can be exemplified by
- (1) lichens
 - (2) plants-mycorrhizae fungi
 - (3) plants-mushrooms
 - (4) leaf cutting ants-fungi
- 1, 2, 3
 - 1, 2, 4
 - 2, 3, 4
 - 1, 2, 3, 4

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21. _____ increase the surface area of roots.
- A) Symplasts
 - B) Mycorrhizae
 - C) Root hairs
 - D) Root hairs and mycorrhizae
22. Which of these involves a symbiotic relationship?
- A) root hairs
 - B) apoplasts
 - C) mycorrhizae
 - D) symplasts
23. If $\Psi_p = 0.3$ MPa and $\Psi_s = -0.5$ MPa, the resulting Ψ is
- A) +0.8 MPa.
 - B) -0.8 MPa.
 - C) -0.2 MPa.
 - D) +0.2 MPa.
24. _____ is to xylem as _____ is to phloem.
- A) Sclerenchyma cell; parenchyma cell
 - B) Apical meristem; vascular cambium
 - C) Vessel element; sieve-tube member
 - D) Cortex; pith
25. Which structure is *incorrectly* paired with its tissue system?
- A) companion cell-ground tissue
 - B) palisade parenchyma-ground tissue
 - C) guard cell-dermal tissue
 - D) root hair-dermal tissue
26. In leaves, chloroplasts are found in
- A) xylem.
 - B) palisade mesophyll.
 - C) phloem
 - D) guard cells.
27. _____ provides cells for secondary growth.
- A) Apical meristem
 - B) Secondary xylem
 - C) Vascular cambium
 - D) Secondary phloem

28. "Totipotency" is a term used to describe the ability of a cell to give rise to a complete new organism. In plants, this means that
- A) plant development is *not* under genetic control.
 - B) the cells of shoots and the cells of roots have different genes.
 - C) cell differentiation depends largely on the control of gene expression.
 - D) a cell's environment has no effect on its differentiation.
29. What tissue makes up most of the wood of a tree?
- A) primary xylem
 - B) secondary xylem
 - C) secondary phloem
 - D) vascular cambium
30. The main way that pine trees disperse their offspring is by using
- A) fruits that are eaten by animals.
 - B) spores.
 - C) windblown seeds.
 - D) flagellated sperm swimming through water.
31. The photosynthetic cells in the interior of a leaf are what kind of cells?
- A) parenchyma
 - B) collenchyma
 - C) sclerenchyma
 - D) phloem
32. Movement of phloem sap from a sugar source to sugar sink
- A) occurs through the apoplast of sieve-tube members.
 - B) may translocate sugars from the breakdown of stored starch in a root up to developing shoots.
 - C) is similar to the flow of xylem sap in depending on tension, or negative pressure.
 - D) depends on the active pumping of water into sieve tubes at the source end.
33. Plants with a dominant sporophyte are successful on land partly because
- A) having no stomata, they lose less water.
 - B) they all disperse by means of seeds.
 - C) diploid plants experience fewer mutations than do haploid plants.
 - D) their gametophytes are protected by, and obtain nutrition from, the sporophytes.
34. Pores on the leaf surface that function in gas exchange are called
- A) hairs.
 - B) xylem cells.
 - C) phloem cells.
 - D) stomata.

35. Which of these is most important in making the typical seed more resistant to adverse conditions than the typical spore?
- A) a different type of sporopollenin
 - B) an internal reservoir of liquid water
 - C) integument(s)
 - D) waxy cuticle
36. Gymnosperms differ from both extinct and extant ferns because they
- A) are woody.
 - B) have spores.
 - C) have pollen.
 - D) have sporophylls.
37. A heterosporous plant is one that
- A) produces a gametophyte that bears both antheridia and archegonia.
 - B) produces microspores and megaspores, which give rise to male and female gametophytes.
 - C) produces spores all year long instead of during just one season.
 - D) produces two kinds of spores, one asexually by mitosis and the other sexually by meiosis.
38. A number of characteristics are very similar between charophyceans and members of the kingdom Plantae. Of the following, which characteristic does *not* provide evidence for a close evolutionary relationship between these two groups?
- A) alternation of generations
 - B) chloroplast structure
 - C) cell plate formation during cytokinesis
 - D) sperm cell structure
39. The following are common to both charophyceans and land plants *except*
- A) chlorophyll *b*.
 - B) lignin.
 - C) chlorophyll *a*.
 - D) cellulose.
40. Each of the following is a general characteristic of bryophytes *except*
- A) a cellulose cell wall.
 - B) vascular tissue.
 - C) chlorophylls *a* and *b*.
 - D) being photosynthetic autotrophs.