Genetics

Choose one answer per question. Circle A, B, C, or D.

1. A pea plant can inherit two different versions of a gene. What is the name for those versions?
   A. Alleles
   B. Organs
   C. Tissues
   D. Organelles

2. Which option gives a genotype for a single classroom trait?
   A. Green stem
   B. Broad leaf
   C. Bb
   D. Tall plant

3. A plant has the genotype tt for a height gene. How would you describe its alleles at that gene?
   A. Heterozygous
   B. Homozygous recessive
   C. Homozygous dominant
   D. Codominant

4. In a model with complete dominance, an Rr pea plant has round seeds. Which other genotype would have the same seed shape?
   A. A single recessive allele with no second allele
   B. Two recessive alleles (rr)
   C. No other genotype
   D. Two dominant alleles (RR)

5. A plant has genotype Aa at a single gene. Its gametes each receive one allele at that gene. Which gametes can it make?
   A. Only gametes with both alleles
   B. Some with A and some with a
   C. Only gametes with the dominant allele
   D. Only gametes with the recessive allele

6. A pea plant with genotype Pp is crossed with a plant with genotype pp. Which fraction of offspring is expected to be heterozygous?

A. One-half
B. One-quarter
C. Three-quarters
D. All

7. Two plants have genotype Gg. In the simple complete-dominance model, what fraction of their offspring is expected to show the recessive phenotype?

A. All
B. One-half
C. Three-quarters
D. One-quarter

8. In a cross between two heterozygous pea plants, an offspring shows the dominant phenotype. What is the probability that this particular offspring is heterozygous?

A. One-half
B. One-quarter
C. Two-thirds
D. Three-quarters

9. In a fictional flower model, RR flowers are red, WW flowers are white, and RW flowers are pink. What fraction of offspring from two pink parents is expected to be white?

A. One-quarter
B. One-half
C. Three-quarters
D. None

10. A fictional flower with genotype AB has separate patches of the A-associated color and the B-associated color. Which pattern best describes this model?

A. Recessive inheritance of both colors
B. Complete dominance of A
C. Incomplete dominance producing an intermediate color
D. Codominance

11. Two genes assort independently. A plant with genotype AaBb is crossed with a plant with genotype aabb. What fraction of the offspring is expected to have genotype Aabb?

A. One-half
B. One-sixteenth
C. One-quarter
D. Three-quarters

12. Plants AaBb and Aabb are crossed. The genes assort independently and both show complete dominance. What is the chance that an offspring shows the dominant A phenotype and the recessive b phenotype?

A. One-eighth
B. Three-eighths
C. One-quarter
D. Three-quarters

13. Each offspring from a cross has a one-quarter chance of showing a recessive trait. For two independently formed offspring, what is the chance that at least one shows it?

A. One-half
B. One-sixteenth
C. One-quarter
D. Seven-sixteenths

14. A test cross produces 45 AB, 45 ab, 5 Ab, and 5 aB offspring, classified by the type of gamete from the heterozygous parent. What pattern does this suggest?

A. The A and B genes are linked, with AB and ab as parental combinations.
B. The genes assort independently, producing all four types equally.
C. The Ab and aB types are parental combinations.
D. Only one allele can be inherited at a time.

15. A test cross produces 200 offspring. There are 14 offspring in one recombinant class and 10 in the other. What is the observed recombination frequency?

A. 24 percent
B. 6 percent
C. 12 percent
D. 88 percent