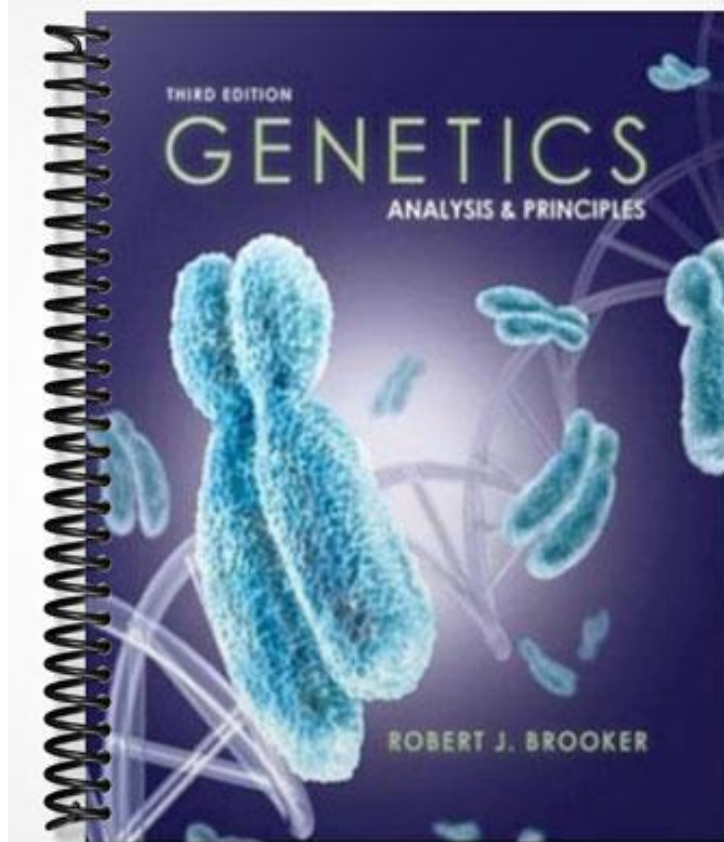


TEST BANK



Chapter 02 Mendelian Inheritance

Student: _____

1. The theory of pangenesis was first proposed by _____.
 - A. Aristotle
 - B. Galen
 - C. Mendel
 - D. Hippocrates
 - E. None of the above
2. Which of the following is correct regarding the blending theory of inheritance?
 - A. It believed that hereditary traits blended from one generation to the next
 - B. It was possible for the blending to change the trait from one generation to the next
 - C. It was supported by early research by Joseph Kölreuter
 - D. It was the prevailing theory of inheritance prior to Mendel
 - E. All of the answers are correct
3. Mendel's work was rediscovered in 1900 by which of the following individual(s)?
 - A. Carl Correns
 - B. Erich von Tschermak
 - C. Hugh de Vries
 - D. All of the answers are correct
4. Mendel's work on inheritance had an immediate influence on the scientific community and theories of inheritance.

True False
5. Which of the following characteristics made the pea plant *Pisum sativum* an ideal organism for Mendel's studies?
 - A. It has the ability to self-fertilize
 - B. It was easy to cross-fertilize one plant with another
 - C. It has easily identifiable traits
 - D. All of the answers are correct

6. The stamen represents the _____ portion of the plant, while the ovules represent the _____ portion of the plant.
- A. Female ; male
 - B. Male ; female
 - C. Female ; female
 - D. Male ; male
7. Differences in plant flower color or plant height, are called a variant of a trait.
- True False
8. Which of the following traits was not studied by Mendel?
- A. Flower color
 - B. Seed color
 - C. Pod color
 - D. Pollen color
 - E. Plant height
9. When studying a genetic cross, the second generation following the initial cross is identified by which of the following?
- A. P generation
 - B. F₁ generation
 - C. F₁¹ generation
 - D. F₂² generation
 - E. P₃³ generation
10. A true breeding line of green pod pea plants is crossed with a true-breeding line of yellow pod plants. All of their offspring have green pods. From this information it can be stated that the green color is _____ to the yellow color.
- A. Recessive
 - B. Dominant
 - C. Subserving
 - D. Blended
 - E. None of the answers are correct
11. Mendel's work with monohybrid crosses provided proof of which of the following?
- A. Blending theory of inheritance
 - B. Particulate theory of inheritance
 - C. Chromosomal theory of inheritance
 - D. Pangenesis
 - E. None of the answers are correct

12. Mendel's work with single-factor crosses resulted in the development of which of the following?
- A. Law of segregation
 - B. Law of independent assortment
 - C. Theory of natural selection
 - D. Law of biological evolution
 - E. All of the answers are correct
13. When Mendel crossed two plants that were heterozygous for a single trait, what was the phenotypic ratio of their offspring?
- A. 1:2:1
 - B. 9:3:3:1
 - C. 3:1
 - D. 7:4
 - E. Varied depending on the trait
14. When Mendel crossed two plants that were heterozygous for a single trait, what was the genotypic ratio of their offspring?
- A. 1:2:1
 - B. 9:3:3:1
 - C. 3:1
 - D. 1:1
 - E. Varied depending on the trait
15. An individual who has two identical alleles for a trait is said to be _____.
- A. Homozygous
 - B. Heterozygous
 - C. Isozygous
 - D. A variant
16. The genetic composition of an individual is called its _____.
- A. Phenotype
 - B. Genotype
 - C. Hybrid
 - D. Dominance
 - E. None of the answers are correct
17. The observable characteristics of an organism are called its _____.
- A. Phenotype
 - B. Genotype
 - C. Dominance
 - D. Genes
 - E. None of the answers are correct

18. An individual who has two different alleles for a trait is called _____.
- A. Haploid
 - B. Homozygous
 - C. Heterozygous
 - D. Isozygous
 - E. True-breeding
19. In a Punnett square diagram, the outside of the box represents the _____.
- A. Diploid offspring
 - B. Haploid offspring
 - C. Diploid gametes
 - D. Haploid gametes
20. Mendel's work with two-factor (dihybrid) crosses led directly to which of the following?
- A. Chromosomal theory of inheritance
 - B. Particulate theory of inheritance
 - C. Law of segregation
 - D. Law of independent assortment
 - E. Theory of biological evolution
21. In a dihybrid cross using Mendelian inheritance, if both parents are heterozygous for both traits, what will be the phenotypic ratio of their offspring?
- A. 3:1
 - B. 1:2:1
 - C. 1:1
 - D. 9:3:3:1
22. If a Punnett square is used to visualize a three-factor cross, how many boxes would be inside of the square?
- A. 3
 - B. 8
 - C. 48
 - D. 64
 - E. Can't be determined
23. In a dihybrid testcross, the individual being examined is crossed to which of the following?
- A. An individual who is homozygous dominant for one trait but not the other
 - B. Self-fertilized
 - C. An individual who is homozygous recessive for both traits
 - D. An individual who is heterozygous for both traits

24. In humans, patterns of inheritance are often studied using which of the following?
- A. Dihybrid testcrosses
 - B. Production of true-breeding lines
 - C. Pedigree analysis
 - D. Self-fertilization
 - E. None of the answers are correct
25. The chance that a future event will occur is called _____.
- A. Probability
 - B. Goodness of fit
 - C. Degrees of freedom
 - D. Random selection
 - E. All of the answers are correct
26. A coin is flipped 100 times, with a result of 53 heads and 47 tails. The deviation between the observed numbers and the expected 50-50 results is called _____.
- A. Probability
 - B. Degrees of freedom
 - C. Goodness of fit
 - D. Random sampling error
 - E. Standard error
27. Which of the following would be used to determine the probability of three independent events in order?
- A. Sum rule
 - B. Product rule
 - C. Chi-square test
 - D. Binomial expansion
 - E. Random sampling error
28. A couple would like to know what the probability is that out of 5 children, three will be girls. This is solved using which of the following?
- A. Sum rule
 - B. Product rule
 - C. Chi-square test
 - D. Binomial expansion
 - E. Random sampling error

29. The probability that one event or another will occur is based on which of the following?
- A. Sum rule
 - B. Product rule
 - C. Chi-square test
 - D. Binomial expansion
 - E. Random sampling error
30. Using Mendel's flower color (purple is dominant, white is recessive), if a two heterozygous plants are crossed, what is the probability that the first two offspring will have purple flowers?
- A. $1/2$
 - B. $1/4$
 - C. $6/4$
 - D. $9/16$
 - E. $1/16$
31. The Chi-square test is used to prove that a hypothesis is correct.
- True False
32. In a genetic cross there are n classes of data. What would the degrees of freedom be for a chi-square test on this data?
- A. n
 - B. $n + 1$
 - C. $n - 1$
 - D. $2n + 1$
 - E. $x(n)$ where x equals the number of individuals in the cross
33. The likelihood that the observation variation from the expected is due to random chance is called the _____.
- A. P value
 - B. Goodness of fit
 - C. Degrees of freedom
 - D. Empirical approach
 - E. None of the answers are correct
34. In the biological sciences, the hypothesis is usually rejected if the P value is _____.
- A. Greater than 1
 - B. Less than 0.30
 - C. Less than 0.95
 - D. Less than 0.05
 - E. Less than 1

35. _____ is the belief that seeds are produced by all parts the body and a transmitted to the next generation.

36. Mendel had experience in the fields of _____ and _____.

37. If two individuals with distinct characteristics are mated, their offspring is called a _____.

38. If over several generations a trait does not vary in a group of organisms, that group can be called a _____.

39. A cross in which a research investigates the patterns of inheritance of a single trait is called a _____.

40. An _____ is a variation of a gene.

41. The _____ represents the genetic composition of an individual.

42. The _____ is the observable characteristics of an individual.

43. In a genetic cross, the _____ represent offspring with genetic combinations that were not found in the parental lines.

44. It is not recommended that you use a Punnett square diagram for crosses involving _____ or more genes.

45. The study of family trees in humans is called a _____ analysis.

46. Statistical analysis determines the _____ between the observed data and what was expected from the initial hypothesis.

47. Explain the importance of a true-breeding line to genetic studies.

48. Explain what is meant by the term *empirical approach*.

49. State Mendel's law of segregation.

50. State Mendel's law of independent assortment.

Chapter 02 Mendelian Inheritance **Key**

- The theory of pangenesis was first proposed by _____.
 - Aristotle
 - Galen
 - Mendel
 - D.** Hippocrates
 - None of the above
- Which of the following is correct regarding the blending theory of inheritance?
 - It believed that hereditary traits blended from one generation to the next
 - It was possible for the blending to change the trait from one generation to the next
 - It was supported by early research by Joseph Kölreuter
 - It was the prevailing theory of inheritance prior to Mendel
 - E.** All of the answers are correct
- Mendel's work was rediscovered in 1900 by which of the following individual(s)?
 - Carl Correns
 - Erich von Tschermak
 - Hugh de Vries
 - D.** All of the answers are correct
- Mendel's work on inheritance had an immediate influence on the scientific community and theories of inheritance.

FALSE
- Which of the following characteristics made the pea plant *Pisum sativum* an ideal organism for Mendel's studies?
 - It has the ability to self-fertilize
 - It was easy to cross-fertilize one plant with another
 - It has easily identifiable traits
 - D.** All of the answers are correct
- The stamen represents the _____ portion of the plant, while the ovules represent the _____ portion of the plant.
 - Female ; male
 - B.** Male ; female
 - Female ; female
 - Male ; male

7. Differences in plant flower color or plant height, are called a variant of a trait.

TRUE

8. Which of the following traits was not studied by Mendel?

- A. Flower color
- B. Seed color
- C. Pod color
- D.** Pollen color
- E. Plant height

9. When studying a genetic cross, the second generation following the initial cross is identified by which of the following?

- A. P generation
- B. F₁ generation
- C.** F₂ generation
- D. F₃ generation
- E. P₃ generation

10. A true breeding line of green pod pea plants is crossed with a true-breeding line of yellow pod plants. All of their offspring have green pods. From this information it can be stated that the green color is _____ to the yellow color.

- A. Recessive
- B.** Dominant
- C. Subservient
- D. Blended
- E. None of the answers are correct

11. Mendel's work with monohybrid crosses provided proof of which of the following?

- A. Blending theory of inheritance
- B.** Particulate theory of inheritance
- C. Chromosomal theory of inheritance
- D. Pangenesis
- E. None of the answers are correct

12. Mendel's work with single-factor crosses resulted in the development of which of the following?

- A.** Law of segregation
- B. Law of independent assortment
- C. Theory of natural selection
- D. Law of biological evolution
- E. All of the answers are correct

13. When Mendel crossed two plants that were heterozygous for a single trait, what was the phenotypic ratio of their offspring?
- A. 1:2:1
 - B. 9:3:3:1
 - C. 3:1**
 - D. 7:4
 - E. Varied depending on the trait
14. When Mendel crossed two plants that were heterozygous for a single trait, what was the genotypic ratio of their offspring?
- A. 1:2:1**
 - B. 9:3:3:1
 - C. 3:1
 - D. 1:1
 - E. Varied depending on the trait
15. An individual who has two identical alleles for a trait is said to be _____.
- A. Homozygous**
 - B. Heterozygous
 - C. Isozygous
 - D. A variant
16. The genetic composition of an individual is called its _____.
- A. Phenotype
 - B. Genotype**
 - C. Hybrid
 - D. Dominance
 - E. None of the answers are correct
17. The observable characteristics of an organism are called its _____.
- A. Phenotype**
 - B. Genotype
 - C. Dominance
 - D. Genes
 - E. None of the answers are correct
18. An individual who has two different alleles for a trait is called _____.
- A. Haploid
 - B. Homozygous
 - C. Heterozygous**
 - D. Isozygous
 - E. True-breeding

19. In a Punnett square diagram, the outside of the box represents the _____.
- A. Diploid offspring
 - B. Haploid offspring
 - C. Diploid gametes
 - D.** Haploid gametes
20. Mendel's work with two-factor (dihybrid) crosses led directly to which of the following?
- A. Chromosomal theory of inheritance
 - B. Particulate theory of inheritance
 - C. Law of segregation
 - D.** Law of independent assortment
 - E. Theory of biological evolution
21. In a dihybrid cross using Mendelian inheritance, if both parents are heterozygous for both traits, what will be the phenotypic ratio of their offspring?
- A. 3:1
 - B. 1:2:1
 - C. 1:1
 - D.** 9:3:3:1
22. If a Punnett square is used to visualize a three-factor cross, how many boxes would be inside of the square?
- A. 3
 - B. 8
 - C. 48
 - D.** 64
 - E. Can't be determined
23. In a dihybrid testcross, the individual being examined is crossed to which of the following?
- A. An individual who is homozygous dominant for one trait but not the other
 - B. Self-fertilized
 - C.** An individual who is homozygous recessive for both traits
 - D. An individual who is heterozygous for both traits
24. In humans, patterns of inheritance are often studied using which of the following?
- A. Dihybrid testcrosses
 - B. Production of true-breeding lines
 - C.** Pedigree analysis
 - D. Self-fertilization
 - E. None of the answers are correct

25. The chance that a future event will occur is called _____.
- A.** Probability
 - B. Goodness of fit
 - C. Degrees of freedom
 - D. Random selection
 - E. All of the answers are correct
26. A coin is flipped 100 times, with a result of 53 heads and 47 tails. The deviation between the observed numbers and the expected 50-50 results is called _____.
- A. Probability
 - B. Degrees of freedom
 - C. Goodness of fit
 - D.** Random sampling error
 - E. Standard error
27. Which of the following would be used to determine the probability of three independent events in order?
- A. Sum rule
 - B.** Product rule
 - C. Chi-square test
 - D. Binomial expansion
 - E. Random sampling error
28. A couple would like to know what the probability is that out of 5 children, three will be girls. This is solved using which of the following?
- A. Sum rule
 - B. Product rule
 - C. Chi-square test
 - D.** Binomial expansion
 - E. Random sampling error
29. The probability that one event or another will occur is based on which of the following?
- A.** Sum rule
 - B. Product rule
 - C. Chi-square test
 - D. Binomial expansion
 - E. Random sampling error

30. Using Mendel's flower color (purple is dominant, white is recessive), if a two heterozygous plants are crossed, what is the probability that the first two offspring will have purple flowers?
- A. 1/2
 - B. 1/4
 - C. 6/4
 - D. 9/16**
 - E. 1/16
31. The Chi-square test is used to prove that a hypothesis is correct.
- FALSE**
32. In a genetic cross there are n classes of data. What would the degrees of freedom be for a chi-square test on this data?
- A. n
 - B. $n + 1$
 - C. $n - 1$**
 - D. $2n + 1$
 - E. $x(n)$ where x equals the number of individuals in the cross
33. The likelihood that the observation variation from the expected is due to random chance is called the _____.
- A. P value**
 - B. Goodness of fit
 - C. Degrees of freedom
 - D. Empirical approach
 - E. None of the answers are correct
34. In the biological sciences, the hypothesis is usually rejected if the P value is _____.
- A. Greater than 1
 - B. Less than 0.30
 - C. Less than 0.95
 - D. Less than 0.05**
 - E. Less than 1
35. _____ is the belief that seeds are produced by all parts of the body and are transmitted to the next generation.
- Pangenesis**
36. Mendel had experience in the fields of _____ and _____.
- physics, mathematics**

37. If two individuals with distinct characteristics are mated, their offspring is called a _____.

hybrid

38. If over several generations a trait does not vary in a group of organisms, that group can be called a _____.

true-breeding line

39. A cross in which a research investigates the patterns of inheritance of a single trait is called a _____.

monohybrid cross (single-factor cross)

40. An _____ is a variation of a gene.

allele

41. The _____ represents the genetic composition of an individual.

genotype

42. The _____ is the observable characteristics of an individual.

phenotype

43. In a genetic cross, the _____ represent offspring with genetic combinations that were not found in the parental lines.

non-parentals

44. It is not recommended that you use a Punnett square diagram for crosses involving _____ or more genes.

three

45. The study of family trees in humans is called a _____ analysis.

pedigree

46. Statistical analysis determines the _____ between the observed data and what was expected from the initial hypothesis.

goodness of fit

47. Explain the importance of a true-breeding line to genetic studies.

A true-breeding line gives a geneticist a known starting point for genetic crosses. Since a true-breeding line does not have any variation for the trait being examined, the researcher knows exactly what that organism is passing on to that generation.

48. Explain what is meant by the term *empirical approach*.

An empirical approach simply means a study of the mathematical relationships associated with a given observation.

49. State Mendel's law of segregation.

Two copies of a gene segregate from each other during transmission from parent to offspring.

50. State Mendel's law of independent assortment.

Two different genes will randomly assort their alleles during the formation of haploid reproductive cells.

51. Explain how Mendel's monohybrid cross led to the concept of dominance, the law of segregation and supported the particulate theory of inheritance.

Answers will vary. See chapter for details.

52. Explain how Mendel's work with the dihybrid cross led to the development of the law of independent assortment.

Answers will vary. See chapter for details.