Chapter 11 Test

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. Each pea-plant gamete has how many alleles for the height gene?
   a. 1
   b. 2
   c. 3
   d. 4

2. The different forms of a gene are called
   a. traits.
   b. pollinations.
   c. alleles.
   d. hybrids.

3. Gregor Mendel removed the male parts from the flowers of some plants in order to
   a. prevent hybrids from forming.
   b. prevent cross-pollination.
   c. to put in a jar and keep next to his bed to stare at all night.
   d. control crosses between plants.

4. If a pea plant has a recessive allele for green peas, it will produce
   a. green peas if it also has a dominant allele for yellow peas.
   b. both green peas and yellow peas if it also has a dominant allele for yellow peas.
   c. green peas if it does not also have a dominant allele for yellow peas.
   d. yellow peas if it does not also have a dominant allele for green peas.

5. When Gregor Mendel crossed a tall plant with a short plant, the F_1 plants inherited
   a. one allele from each parent.
   b. two alleles from each parent.
   c. three alleles from each parent.
   d. four alleles from each parent.

6. If a pea plantÕs alleles for height are *tt,* what is true of its parents?
   a. Both parents were tall.
   b. Both parents were short.
   c. Both parents contributed a recessive allele.
   d. Both parents contributed a dominant allele.

7. A tall plant (*TT*) is crossed with a short plant (*tt*). If the tall F_1 pea plants are allowed to self-pollinate,
   a. the offspring will be of medium height.
   b. all of the offspring will be tall.
   c. all of the offspring will be short.
   d. the offspring can be tall or short.

8. When you flip a coin, what is the probability that it will come up tails?
   a. 1
   b. 1/2
   c. 1/4
   d. 1/8

9. The principles of probability can be used to
   a. predict the traits of the offspring of genetic crosses.
   b. determine the actual outcomes of genetic crosses.
   c. determine which species should be used in genetic crosses.
   d. decide which organisms are best to use in genetic crosses.

10. A heterozygous tall pea plant is crossed with a short plant. The probability that an F_1 plant will be tall is
    a. 25%.
    b. 50%.
    c. 75%.
    d. 100%.

11. Organisms that have two identical alleles for a particular trait are said to be
    a. hybrid.
    b. homozygous.
    c. heterozygous.
    d. dominant.

		Tt	
		T	***t***
TT	***T***	***TT***	***Tt***
	T	***TT***	***Tt***

T	=	***Tall***
t	=	***Short***

Figure 11Ð1

12. In the Punnett square shown in Figure 11Ð1, which of the following is true about the offspring resulting from the cross?
    a. About half are expected to be short.
    b. All are expected to be short.
    c. About three fourths are expected to be tall.
    d. All are expected to be tall.

13. What principle states that during gamete formation genes for different traits separate without influencing each otherÕs inheritance?
    a. principle of dominance
    b. principle of independent assortment
    c. principle of probabilities
    d. principle of segregation

		RrYy			
		RY	***Ry***	***rY***	***ry***
RrYy	***RY***	***RRYY***	***RRYy***	***RrYY***	***RrYy***
	Ry	***RRYy***	***RRyy***	***RrYy***	***Rryy***
	rY	***RrYY***	***RrYy***	***rrYY***	***rrYy***
	ry	***RrYy***	***Rryy***	***rrYy***	***rryy***

Figure 11Ð2

14. The Punnett square in Figure 11Ð2 shows that the gene for pea shape and the gene for pea color
    a. assort independently.
    b. are linked.
    c. have the same alleles.
    d. are always homozygous.

15. Gregor MendelÕs principles of genetics apply to

a. plants only.
b. animals only.
c. pea plants only.
d. all organisms.

16. Roan cattle show codominance for the color of their hair. There are alleles for red hair and white hair. What would you expect a heterozygous roan bull to look like if the trait showed incomplete dominance instead?
a. It would be red.
b. It would be white.
c. It would be spotted.
d. It would be pink.

17. Situations in which one allele for a gene is not completely dominant over another allele for that gene are called
a. multiple alleles.
b. incomplete dominance.
c. polygenic inheritance.
d. multiple genes.

18. In rabbits, there are four different versions of the gene for coat color. What pattern of inheritance is this?
a. incomplete dominance.
b. polygenic inheritance.
c. codominance.
d. multiple alleles.

19. Variation in human skin color is an example of
a. incomplete dominance.
b. codominance.
c. polygenic traits.
d. multiple alleles.

20. The number of chromosomes in a gamete is represented by the symbol
a. Z.
b. X.
c. N.
d. Y.

21. If an organismÕs diploid number is 12, its haploid number is
a. 12.
b. 6.
c. 24.
d. 3.

22. Gametes have
a. homologous chromosomes.
b. twice the number of chromosomes found in body cells.
c. two sets of chromosomes.
d. one allele for each gene.

23. Gametes are produced by the process of
a. mitosis.
b. meiosis.
c. crossing-over.
d. replication.

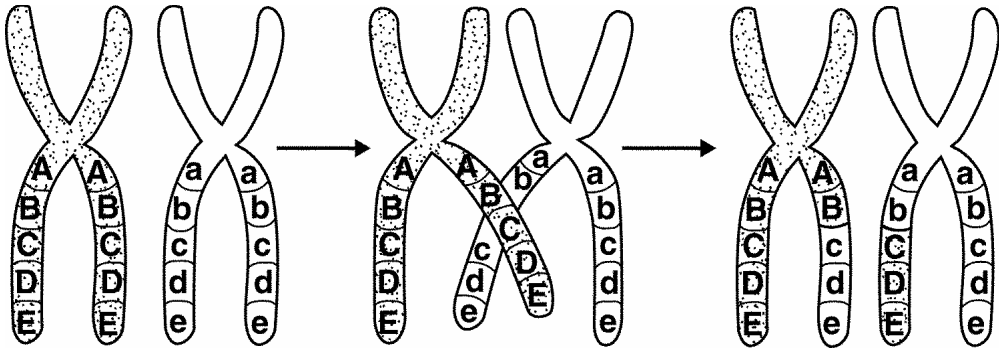

Figure 11Ð4

24. What is shown in Figure 11Ð4?
a. independent assortment
b. anaphase I of meiosis
c. crossing-over
d. replication

25. Chromosomes form tetrads during

a. prophase I of meiosis.
b. metaphase I of meiosis.
c. interphase.
d. anaphase II of meiosis.

26. A tetrad consists of
a. a homologous pair of chromosomes, each made of two chromatids.
b. the four copies of a chromosome that are normally present in cells.
c. two sister chromatids that have each been replicated during interphase.
d. a parental chromosome that was replicated to form a pair, then replicated again.

27. Unlike mitosis, meiosis results in the formation of
a. diploid cells.
b. haploid cells.
c. 2N daughter cells.
d. body cells.

28. What is formed at the end of meiosis?
a. two genetically identical cells
b. four genetically different cells
c. four genetically identical cells
d. two genetically different cells

29. One way that meiosis I is different from mitosis is that
a. replication occurs during interphase before mitosis, but not before meiosis I.
b. meiosis I produces 2 haploid daughter cells, but mitosis produces 2 diploid daughter cells.
c. homologous chromosomes are segregated during mitosis, but remain together during meiosis I.
d. sister chromatids are pulled apart during meiosis I, but not during mitosis.

30. Which of the following assort independently?
a. chromosomes
b. linked genes
c. multiple alleles
d. codominant alleles

31. Linked genes
a. are never separated.
b. assort independently.
c. are on the same chromosome.
d. are always recessive.

32. Gene maps are based on
a. the frequencies of crossing-over.
b. independent assortment.
c. genetic diversity.
d. the number of genes in a cell.

33. If two genes are on the same chromosome and rarely assort independently,
a. crossing-over never occurs between the genes.
b. crossing-over always occurs between the genes.
c. the genes are probably located far apart from each other.
d. the genes are probably located close to each other.

Completion

Complete each statement.

34. The plants that Gregor Mendel crossed to produce the F_1 generation made up the _____ generation.

35. Due to the process of segregation, alleles separate during the production of _____ .

36. The principle of independent assortment states that _____ for different traits can segregate independently during the formation of gametes.

37. If pea plants that are homozygous for round, yellow seeds (*RRYY*) were crossed with pea plants that are heterozygous for round, yellow seeds (*RrYy*), the expected phenotype(s) of the offspring would be _____.

38. In four oÕclock plants, if you cross a red and white flower you end up with a pink flower this shows _____.

39. An organismÕs gametes have _____ the number of chromosomes found in the organismÕs body cells.

40. Crossing-over occurs during the stage of meiosis called _____.

41. The relative locations of each known gene can be shown on a _____ map.

Short Answer

42. What is a hybrid and give an example of one? (4pt)

43. What is segregation and how does it work or affect gamete formation? (4pt)

44. What is the difference between and genotype and a phenotype? (4pt)

45. Perform this mono hybrid cross: One parent that has excessive earwax, EE, (the type that runs down the side of their face) mates with someone that also has excessive earwax Ee. So when they sit together cheek to cheek their heads stick together. What is the offsprings genotypic ratio and what is the phenotypic ratio? (3pt)

46. Perform this dihybrid cross: In the esquilax one parent is heterozygous for projectile vomiting, and homozygous recessive for consuming other esquilaxs' vomit. The other parent is homozygous dominant for both the projectile vomit and consuming others vomit. What will the possible genotypes be for the offspring and what will be the phenotypic and genotypic ratios? (3pt)

47. What is polygenic inheritance? Give one example. (4pt)

48. What is the difference between diploid and haploid? (4pt)

49. What are the three main differences between Meiosis and Mitosis? (3pt)

50. What were MorganÕs two conclusions about genetic linkage? (4pt)