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## Biology Chapter 10 Test: Sexual Reproduction and Genetics

## True/False

Indicate whether the statement is true or false.

- 1. A gamete has one-half the number of chromosomes of a regular body cell.
- 2. Homologous chromosomes are two chromosomes with identical DNA sequences.
- 3. During meiosis, chromosome number is reduced through three rounds of cell division.
_- 4. In humans, the ability to roll one's tongue is a dominant trait. Therefore, a tongue roller can only have children who are also tongue rollers.

5. The separation of genes during crossing over occurs more frequently between genes that are far apart on a chromosome than for genes that are close together.
6. Polyploidy is more common in plants than animals.
$\qquad$ 7. During meiosis I, homologus chromosome pairs are separated when the centromeres split apart.
7. Gregor Mendel's research supports the idea each organism carries a pair of alleles.

## Multiple Choice

Identify the choice that best completes the statement or answers the question.
9. In mink, brown fur color is dominant to silver-blue fur color. If a homozygous brown mink is mated with a silver-blue mink and 8 offspring are produced, how many would be expected to be silver-blue?
a. 0
b. 3
c. 6
d. 8
$\qquad$ 10. The diagram in Figure 10-2 shows a diploid cell with two homologous pairs of chromosomes. Due to independent assortment, the possible allelic combinations that could be found in gametes produced by the meiotic division of this cell are $\qquad$ .


Figure 10-2
a. $B b, D d, B B$, and $D D$
c. BbDd and BDbd
b. $B D, h D, B d$, and $h d$
d. Bd and $b D$ only
11. Using Figure 10-3, which process would result in the formation of chromosome C from chromosomes A and B?


Figure 10-3
a. asexual reproduction
c. crossing over
b. independent assortment
d. segregation


Figure 10-5
12. What is the genotype of gencration 1 in Figure $10-5$ ?
a. II
c. $i i$
b. $I i$
d. $I$


Figure 10-7
13. What fraction of this cross will be recessive for both traits?
a. $\quad 1 / 2$
b. $\quad 1 / 4$
c. $1 / 8$
d. $1 / 16$
14. Which event during meiosis leads to a reduction in chromosome number from $2 n$ to $n$ ?
a. Pairs of homologous chromosomes line up at the equator.
b. DNA undergoes replication.
c. Homologous chromosomes travel to opposite sides of the cell.
d. Sister chromatids are pulled apart at the centromere.
$\qquad$ 15. Crossing over would most likely occur during which stage of the cell cycle?
a. when DNA is being replicated
b. when homologous chromomosomes line up in pairs
c. when centromeres are separated
d. when cytokinesis begins
16. Which is the best description of the events that take place during anaphase II?
a. The replicated chromosomes become visible.
b. Homologous chromosomes line up along the equator.
c. Sister chromatids are separated and pulled to opposite sides of the cell.
d. Homologous pairs are separated and pulled to opposite sides of the cell.
17. What is the role of the spindle fibers?
a. to join homologous chromosomes together
b. to store nucleotides prior to DNA synthesis
c. to initiate the formation of the nuclear membrane
d. to move chromosomes in the cell
18. The typical human body cell contains 46 chromosomes. How many chromosomes are found in a typical human sperm?
a. 23
b. 45
c. 46
d. 92
19. Suppose an animal is heterozygous $A a B b$, and the traits are not linked. When meiosis occurs, what is the total number of possible combinations of gametes that can be made for these traits?
a. 2
b. 4
c. 6
d. 8
20. During which phase of meiosis do homologous pairs of chromosomes line up next to one another along the equator?
a. anaphase I
c. prophase II
b. metaphase I
d. metaphase II
21. Which stage of meiosis is responsible for the law of independent assortment?
a. metaphase I
c. telophase I
b. prophase I
d. metaphase II
22. A true-breeding tall pea plant is crossed with a true-breeding short pea plant, and all the offspring are tall. What is the most likely genotype of the offspring assuming a single-gene trait?
a. $t t$
b. $T t$
c. $T T$
d. $T T$ or $t$
23. If two heterozygous individuals are crossed, what percent of their offspring are also expected to be heterozygous?
a. 0
b. 50
c. 75
d. 100


## Figure 10-9

24. Consider the cell labeled X in Figure 10-9 containing 4 chromosomes. Which of the four cells below it represents a healthy gamete that could be produced from this cell?
a. $\wedge$
c. C
b. B
d. D


Figure 10-10
25. Which stage of meiosis is represented in Figure $10-10$ ?
a. anaphase I
c. anaphase II
b. metaphase I
d. metaphase II

