Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Class: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Meiosis + Mendel + Chromosomes

Independent Questions 9-20

*Use page 290 in your textbook for tips on how to solve complex genetics problems.*

9. A triploid cell contains sets of three homologous chromosomes. If a cell of a usually diploid species with 42 chromosomes per cell is triploid, this cell would be expected to have which of the following?

A) 63 chromosomes in 31.5 pairs

B) 63 chromosomes in 21 sets of 3

C) 63 chromosomes, each with three chromatids

D) 21 chromosome pairs and 21 unique chromosomes

Bloom's Taxonomy: Application/Analysis

Section: 13.2

10. If a cell has completed meiosis I and is just beginning meiosis II, which of the following is an appropriate description of its contents?

A) It has half the amount of DNA as the cell that began meiosis.

B) It has half the chromosomes but twice the DNA of the originating cell.

C) It has one-fourth the DNA and one-half the chromosomes as the originating cell.

D) It is identical in content to another cell formed from the same meiosis I event.

Bloom's Taxonomy: Application/Analysis

Section: 13.3

11. Independent assortment of chromosomes is a result of \_\_\_\_\_.

A) the random way each pair of homologous chromosomes lines up at the metaphase plate during meiosis I

B) the random combinations of eggs and sperm during fertilization

C) the random distribution of the sister chromatids to the two daughter cells during anaphase II

D) the diverse combination of alleles that may be found within any given chromosome

Bloom's Taxonomy: Knowledge/Comprehension

Section: 13.4

12. Homologous chromosomes \_\_\_\_\_.

A) are identical

B) carry information for the same traits

C) carry the same alleles

D) align on the metaphase plate in meiosis II

Bloom's Taxonomy: Knowledge/Comprehension

Section: 13.2

13. How many unique gametes could be produced through independent assortment by an individual with the genotype *AaBbCCDdEE*?

A) 4

B) 8

C) 16

D) 64

Bloom's Taxonomy: Application/Analysis

Section: 14.1

14. Mendel accounted for the observation that traits that had disappeared in the F1 generation reappeared in the F2 generation by proposing that \_\_\_\_\_.

A) new mutations were frequently generated in the F2 progeny, "reinventing" traits that had been lost in the F1

B) the mechanism controlling the appearance of traits was different between the F1 and the F2 plants

C) traits can be dominant or recessive, and the recessive traits were obscured by the dominant ones in the F1

D) members of the F1 generation had only one allele for each trait, but members of the F2 had two alleles for each trait

Bloom's Taxonomy: Knowledge/Comprehension

Section: 14.1

15. Two true-breeding stocks of pea plants are crossed. One parent has red, axial flowers and the other has white, terminal flowers; all F1 individuals have red, axial flowers. The genes for flower color and location assort independently. Among the F2 offspring, what is the probability of plants with white axial flowers?

A) 9/16

B) 1/16

C) 3/16

D) 1/4

Bloom's Taxonomy: Application/Analysis

Section: 14.2

16. A man has extra digits (six fingers on each hand and six toes on each foot). His wife and their daughter have a normal number of digits. Having extra digits is a dominant trait. The couple's second child has extra digits. What is the probability that their next (third) child will have extra digits?

A) 1/2

B) 1/16

C) 1/8

D) 3/4

Bloom's Taxonomy: Application/Analysis

Section: 14.2

17. Males are more often affected by sex-linked traits than females because \_\_\_\_\_.

A) male hormones such as testosterone often alter the effects of mutations on the X chromosome

B) female hormones such as estrogen often compensate for the effects of mutations on the X chromosome

C) X chromosomes in males generally have more mutations than X chromosomes in females

D) males are hemizygous for the X chromosome

Bloom's Taxonomy: Knowledge/Comprehension

Section: 15.2

18. What does a frequency of recombination of 50% indicate?

A) The two genes are likely to be located on different chromosomes.

B) All of the offspring have combinations of traits that match one of the two parents.

C) The genes are located on sex chromosomes.

D) Abnormal meiosis has occurred.

Bloom's Taxonomy: Knowledge/Comprehension

Section: 15.3

19. A couple has a child with Down syndrome. The mother is 39 years old at the time of delivery. Which of the following is the most probable cause of the child's condition?

A) The woman inherited this tendency from her parents.

B) The mother had a chromosomal duplication.

C) One member of the couple underwent nondisjunction in somatic cell production.

D) The mother most likely underwent nondisjunction during gamete production.

Bloom's Taxonomy: Application/Analysis

Section: 15.4

20. Cinnabar eyes is a sex-linked, recessive characteristic in fruit flies. If a female having cinnabar eyes is crossed with a wild-type male, what percentage of the F1 males will have cinnabar eyes?

A) 0%

B) 25%

C) 50%

D) 100%

Bloom's Taxonomy: Application/Analysis

Section: 15.2