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BIOLOGY

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BIOLOGY QUIZ

Chapter 13: Meiosis and Sexual Life Cycles

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1. What is a locus?
 - A. the precise DNA sequence of a gene
 - B. a cell with two chromosome sets
 - C. the precise location of a gene on a chromosome
 - D. a structure that appears during prophase I and consists of two paired genes

2. Fertilization produces _____.

Hint: Think about the similarities and differences among the different types of life cycles.

- A. a diploid zygote
- B. a haploid zygote
- C. a haploid zygote in some life cycles and a diploid zygote in others
- D. a diploid zygote, except during the gametophyte stage of alternation of generations

3. Which, if any, of the following statements is true?

Hint: What are the roles of mitosis and meiosis in different life cycles?

- A. Diploid cells can divide by mitosis.
- B. Haploid cells can divide by mitosis.
- C. Diploid cells can divide by meiosis.
- D. All of the above responses are correct.

4. In sexually reproducing species, the chromosome number remains stable over time because _____ and _____ always alternate.

Hint: Consider what happens to the chromosome number in each of the events.

- A. mitosis ... fertilization
- B. meiosis ... fertilization
- C. meiosis I ... meiosis II
- D. meiosis ... mitosis

5. The egg (ovum) of a rabbit contains 22 chromosomes. How many chromosomes are in the somatic (body) cells of a rabbit?

Hint: What happens during fertilization?

- A. 11
- B. 22
- C. 44
- D. 88

6. In a diploid cell containing 10 chromosomes, meiosis results in the formation of daughter cells containing _____ chromosomes.

Hint: Consider the purpose of meiosis in the life cycle of a sexually reproducing organism.

- A. 0
- B. 5
- C. 10
- D. 20

7. How many pairs of autosomes do humans have?

Hint: Consider how many pairs of chromosomes a human has and how many of these pairs are not autosomes.

- A. 22
- B. 23
- C. 2
- D. 1
- E. It depends on the sex of the individual.

8. Sister chromatids _____.

Hint: What are the major differences between sister chromatids and homologous chromosomes?

- A. are involved in meiosis only
- B. are involved in mitosis only
- C. are identical copies of each other formed through DNA synthesis
- D. have the same gene loci but may have different alleles of some genes

9. Which of the following statements about homologous chromosomes is correct?

- A. They are found in the cells of human females but not in those of human males.
- B. They are found in haploid cells.
- C. They pair up in prophase II.
- D. They have genes for the same traits at the same loci.

10. When we say that an organism is haploid, we mean that _____.

Hint: Contrast haploid with diploid.

- A. its cells have a single set of chromosomes
- B. its cells have half of one set of chromosomes
- C. its cells have two sets of chromosomes
- D. it has one half of a chromosome

11. Which of the following is a function of mitosis in humans?

Hint: Contrast meiosis with mitosis.

- A. production of eggs
- B. production of sperm
- C. multiplication of body cells
- D. increasing genetic variability

12. Somatic cells in humans contain _____ set(s) of chromosomes and are therefore termed _____.

Hint: Contrast somatic cells with gametes.

- A. two ... haploid
- B. two ... diploid
- C. one ... diploid
- D. one ... haploid

13. Nearly all life cycles have both haploid and diploid phases. Usually, the transition from haploid to diploid takes place _____.

Hint: Consider which of these events reflects a doubling in chromosome number.

- A. at fertilization, when gametes fuse
- B. during crossing over in meiosis
- C. when DNA is replicated during the S phase of the cell cycle
- D. when mitotic cytokinesis occurs

14. Humans have 46 chromosomes. This number of chromosomes will be found in _____.

Hint: Consider somatic cells.

- A. all the cells of the body
- B. all cells in anaphase of mitosis
- C. liver cells
- D. all gamete-producing cells after meiosis I

15. Which of the following results in cells that contain half the parental chromosome number?

Hint: Consider the differences between mitosis and meiosis.

- A. interphase
- B. metaphase
- C. mitosis
- D. Meiosis

16. At the end of telophase I of meiosis and the first cytokinesis, there are _____.

Hint: Consider the events of meiosis I. How many cell divisions occur in meiosis?

- A. two haploid cells
- B. two diploid cells
- C. four haploid cells
- D. four diploid cells

17. Synapsis occurs during _____.

Hint: Review the events of meiosis.

- A. prophase I
- B. prophase II
- C. anaphase I
- D. Cytokinesis

18. Which of the following occurs during anaphase II?

Hint: Review the events of meiosis II. The same structures are separated during anaphase of mitosis.

- A. Nuclei re-form.
- B. Homologs separate and migrate toward opposite poles.
- C. Sister chromatids separate and migrate toward opposite poles.
- D. The synaptonemal complex disappears.

19. Cytokinesis is the _____.

Hint: Technically, mitosis and meiosis refer to the distribution of chromosomes to new nuclei in the process of cell division.

- A. formation of tetrads
- B. lining up of tetrads at the metaphase plate
- C. exchange of homologous regions of nonsister chromatids
- D. division of the cytoplasm to create two cells

20. Regions of chromosomes where nonsister chromatids cross over are called _____.

- A. chiasmata
- B. tetrads
- C. homologs
- D. Kinetochores

21. Which event occurs only during prophase I of the first meiotic division?

Hint: Crossing over occurs during this phase

- A. A spindle of microtubules forms.
- B. Homologous chromosomes line up at the center of the cell.
- C. The nuclear membrane breaks down.
- D. Synapsis of homologous pairs occurs.

22. Which of the following contributes to genetic variation in sexually reproducing species?

Hint: How does each of these affect chromosome number or complexity? All three have to be correct.

- A. independent assortment, spindle formation, random fertilization
- B. random fertilization, independent assortment, crossing over
- C. crossing over, internal fertilization, independent assortment
- D. random fertilization, DNA synthesis, independent assortment

Answers:

- 1. C
- 2. A
- 3. D
- 4. B
- 5. C
- 6. B
- 7. A
- 8. C
- 9. D
- 10. A
- 11. C
- 12. B
- 13. A
- 14. C
- 15. D
- 16. A
- 17. A
- 18. C
- 19. D
- 20. A
- 21. D
- 22. B