

Cell Division Test - Mitosis / Meiosis December 2009

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

1. When a cell undergoes mitosis, the daughter cells must inherit...
 - a. DNA.
 - b. organelles.
 - c. cytoplasm.
 - d. DNA and cytoplasm.
 - e. DNA, organelles, and cytoplasm.
2. The longest part of the cell cycle is usually...
 - a. anaphase.
 - b. interphase.
 - c. metaphase.
 - d. prophase.
 - e. telophase.
3. Virchow's simple and profound principle, stated formally in 1858, was that...
 - a. photosynthesis is the center of all life.
 - b. animals must develop.
 - c. every cell from a cell.
 - d. all life evolves.
 - e. animals must always reproduce.
4. Chromosomes are duplicated during which period?
 - a. M
 - b. D
 - c. G₁
 - d. G₂
 - e. S
5. Human gametes are best described by the term...
 - a. polyploid.
 - b. diploid.
 - c. triploid.
 - d. haploid.
 - e. tetraploid.
6. The nuclear envelope begins to break up in late...
 - a. anaphase
 - b. interphase
 - c. metaphase
 - d. prophase
 - e. telophase
7. The chromosomes are aligned at the middle of the cell during...
 - a. anaphase.
 - b. metaphase.
 - c. interphase.
 - d. prophase.
 - e. telophase.

8. **The spindle apparatus becomes visible during...**
- anaphase.
 - metaphase.
 - interphase.
 - prophase.
 - telophase.
9. **The chromosomes detach from one another and become visibly separated during...**
- anaphase.
 - metaphase.
 - interphase.
 - prophase.
 - telophase.
10. **Which of the following is likely to account for the difference between plant and animal cell cytokinesis?**
- Plant cells lack microfilaments for forming a cleavage furrow.
 - Plant and animal cells do not have a common ancestor.
 - Animal cells lack chloroplasts.
 - Plant cells have two sets of chromosomes while animal cells have one set of chromosomes.
 - Each plant cell division must maintain the integrity of the cell wall.
11. **The nuclear membrane reforms during...**
- anaphase.
 - metaphase.
 - interphase.
 - prophase.
 - telophase.
12. **Strictly speaking, mitosis and meiosis are divisions of the...**
- nucleus.
 - cytoplasm.
 - chromosomes.
 - only nucleus and chromosomes.
 - nucleus, cytoplasm, and chromosomes.
13. **Which of the following is the proper sequence for the phases of mitosis?**
- metaphase
 - telophase
 - prophase
 - anaphase
- I, III, IV, II
 - I, II, III, IV
 - III, I, IV, II
 - IV, I, III, II
 - III, IV, I, II

14. In which of the stages below does the chromosome consist of two DNA molecules?
- I. metaphase
 - II. telophase
 - III. prophase
 - IV. anaphase
- a. III and IV
 - b. I, III, and IV
 - c. I and III
 - d. I, II, and III
 - e. I, II, III, and IV
15. **Cytokinesis (cytoplasmic division) in animal cells...**
- a. begins with various deposits of material associated with vesicles and with groups of microtubules at each pole of the nucleus.
 - b. occurs when the plasma membrane is pulled inward by a ring of microtubules that has become attached to the cell plate.
 - c. usually follows nuclear division.
 - d. begins with the deposition of a very rigid lipid bilayer, which is the major constituent of the cell wall.
 - e. all of these
16. **Cytokinesis (cytoplasmic division) in plant cells...**
- a. begins with various deposits of material associated with vesicles and with groups of microtubules at each pole of the nucleus.
 - b. occurs when the plasma membrane is pulled inward by a ring of microtubules that has become attached to the cell plate.
 - c. usually precedes nuclear division.
 - d. begins with the deposition of a very rigid lipid bilayer, which is the major constituent of the cell wall.
 - e. all of these
17. Which of the following parts of the cell cycle is not a part of mitosis?
- a. anaphase
 - b. prophase
 - c. interphase
 - d. telophase
 - e. metaphase
18. Which of the following must occur for a plant or an animal to grow and develop normally?
- a. Sufficient light must be available to stimulate cell division.
 - b. Sufficient oxygen must be available to stimulate cell division.
 - c. It must be able to control the timing and rate of cell division in different parts of its body.
 - d. The organism must receive a supply of the appropriate hormones from its parents.
 - e. None of these choices is correct.

19. Which one of the following is ~~not~~ a function of mitosis? Mitosis helps organisms...

- YES a. regenerate lost parts.
- YES b. repair tissues.
- YES c. grow.
- NO d. reproduce asexually.
- e. All of these choices are correct.

BAD QUESTION

20. How many metaphase alignments are possible in humans?

- a. 2^{23} .
- b. 2^{46} .
- c. 23^2 .
- d. 46^2 .
- e. 46.

21. Which of the following occurs during Interphase?

- a. chromosome replication
- b. division of centromere
- c. lining up chromosomes at the cellular equator
- d. spindle microtubules attach to centromeres
- e. chromosomes migrate to opposite ends of the cell

22. Daughter cells produced asexually via mitosis are...

- a. identical to each other.
- b. identical to the parent cell.
- c. different from the parent cell.
- d. different from each other.
- e. identical to each other and identical to the parent cell.

23. Sexual reproduction...

- a. leads to uniform characteristics in a population.
- b. results in new combinations of genetic traits.
- c. produces genetic clones.
- d. requires less tissue differentiation than asexual reproduction.
- e. produces genetic clones and requires less tissue differentiation than asexual reproduction.

24. Which process is absolutely necessary for sexual reproduction to occur in a life cycle, but is not necessarily required for organisms that only reproduce asexually?

- a. prokaryotic fission
- b. mitosis
- c. meiosis
- d. cytokinesis
- e. karyokinesis

BAD QUESTION

25. **The essence of meiosis is that...**
- gametes are formed that receive one copy of *each* member of *each* pair of homologous chromosomes.
 - gametes are formed that are diploid.
 - each gamete receives one member of *each* pair of homologous chromosomes.
 - gametes are formed that are haploid.
 - each gamete receives one member of *each* pair of homologous chromosomes, and the gametes formed are haploid.
26. **Homologous chromosomes...**
- may exchange parts during meiosis.
 - have their centromeres in the same position.
 - are in pairs, one chromosome of each pair from the father and one from the mother.
 - pair up during meiosis.
 - all of these
27. **Meiosis typically results in the production of...**
- 2 diploid cells.
 - 4 diploid cells.
 - 4 haploid cells.
 - 2 haploid cells.
 - 1 triploid cell.
28. **The chromosomal DNA is duplicated in _____ of meiosis.**
- prophase I
 - metaphase I
 - interphase
 - prophase II
 - anaphase II
29. **Each of the cells formed during telophase I is...**
- diploid.
 - tetraploid.
 - in synapsis.
 - ready to be fertilized.
 - haploid.
30. **When do sister chromatids separate during meiosis?**
- metaphase II.
 - anaphase II.
 - telophase I.
 - metaphase I.
 - prophase II.

31. **Crossing over...**
- a. generally results in binary fission.
 - b. involves nucleoli.
 - c. involves breakages and exchanges being made between sister chromatids.
 - d. alters the composition of chromosomes and results in new combinations of alleles being channeled into the daughter cells.
 - e. all of these
32. **Synapsis and crossing over occur during...**
- a. anaphase I.
 - b. metaphase II.
 - c. prophase I.
 - d. prophase II.
 - e. telophase II.
33. **During which phase of meiosis will the chromosomes appear as tetrads?**
- a. anaphase I
 - b. telophase II
 - c. anaphase II
 - d. prophase I
 - e. metaphase II
34. **Crossing over is one of the most important events in meiosis because...**
- a. it produces new arrays of alleles on chromosomes.
 - b. homologous chromosomes must be separated into different daughter cells.
 - c. the number of chromosomes allotted to each daughter cell must be halved.
 - d. homologous chromatids must be separated into different daughter cells.
 - e. all of these
35. **Gamete formation is...**
- a. the result of the process of mitosis.
 - b. the pairing of homologous chromosomes.
 - c. the formation of sex cells.
 - d. the fusion of gametes.
 - e. a process that occurs only in asexually reproducing forms.
36. **How many mature eggs are produced from a single initial oocyte?**
- a. one
 - b. two
 - c. three
 - d. four
 - e. eight
37. **Which process listed below does *not* produce variation?**
- a. crossing over
 - b. random alignment of chromosomes during meiosis
 - c. asexual reproduction
 - d. genetic recombination of alleles
 - e. sexual reproduction

38. In comparing mitosis and meiosis, which of the following statements is true?

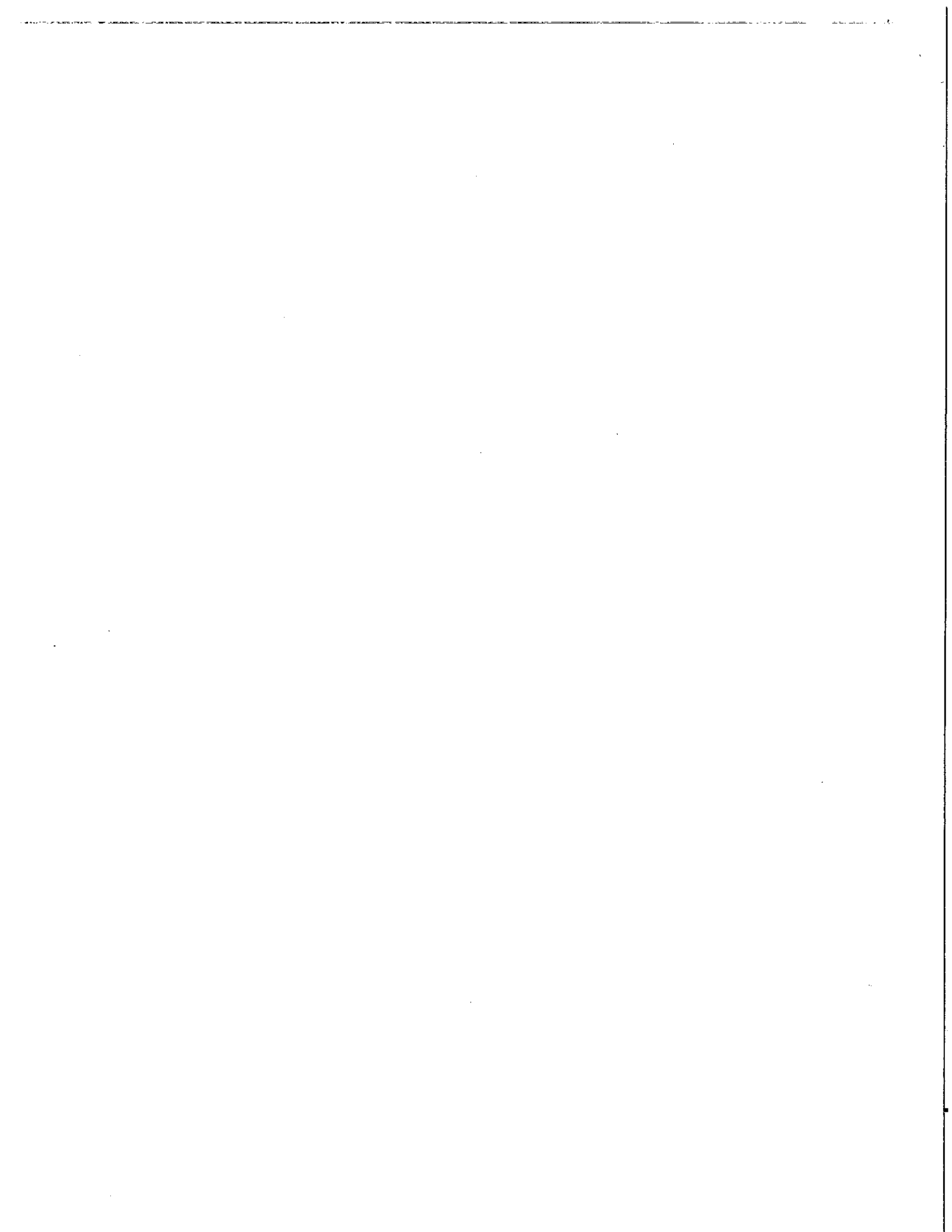
- a. Meiosis I is more like mitosis than is meiosis II.
- b. Both processes result in four cells.
- c. Synapsis (pairing of chromosomes) occurs in both.
- d. Chromatids are present only in mitosis.
- e. Meiosis II resembles mitosis.

39. Which of the following cells contains only one set of chromosomes?

- a. zygote
- b. somatic cells
- c. gamete
- d. diploid
- e. skin cells

40. Which of the following statements is not characteristic of meiosis?

- a. involves two divisions
- b. reduces the number of chromosomes
- c. results in producing genetically identical cells
- d. produces haploid cells
- e. occurs in the gonads



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