Mitosis and Meiosis Test

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

1. What happens during meiosis but not in mitosis that reduces the number of chromosomes?
   a. DNA Replication occurs once and the cell divides once
   b. DNA Replication occurs once but the cell divides twice
   c. Crossing-over occurs.
   d. Metaphase occurs.

2. Which event occurs during interphase?
   a. Spindle fibers begin to form.
   c. The cell grows.
   d. Centromeres divide.

3. The two main stages of eukaryotic cell division are called
   a. mitosis and cytokinesis.
   b. synthesis and cytokinesis.
   c. the M phase and the S phase.
   d. mitosis and interphase.

4. During which phase(s) of mitosis are structures like the one shown in Figure 10–2 visible?
   a. anaphase and interphase
   b. prophase and metaphase
   c. anaphase and prophase
   d. metaphase only

5. The structures labeled B in Figure 10–2 are called
   a. spindles.
   b. centromeres.
   c. centrioles.
   d. sister chromatids.

6. The structure labeled A in Figure 10–2 is called the
   a. sister chromatid.
   b. centriole.
   c. centromere.
   d. spindle.

7. Which of the following represents the phases of mitosis in their proper sequence?
   a. interphase, prophase, metaphase, anaphase, telophase
   b. prophase, anaphase, metaphase, telophase
   c. prophase, metaphase, anaphase, telophase
   d. interphase, prophase, metaphase, telophase

8. If the surface area of a cell increases 100 times, its volume increases about
   a. 10 times.
   b. 5 times.
   c. 1000 times.
   d. 100 times.
9. What is the role of the spindle during mitosis?
   a. It makes the chromosomes visible.
   b. It breaks down the nuclear membrane.
   c. It duplicates the DNA.
   d. It helps separate the chromosomes.

10. When during the cell cycle is a cell’s DNA replicated?
    a. S phase
    b. G2 phase
    c. G1 phase
    d. M phase

11. During normal mitotic cell division, a parent cell having four chromosomes will produce two daughter cells, each containing
    a. sixteen chromosomes.
    b. two chromosomes.
    c. eight chromosomes.
    d. four chromosomes.

12. After cell division, each daughter cell
    a. has more DNA in its nucleus than the parent cell.
    b. has a higher surface area/volume ratio than the parent cell.
    c. has a lower surface area/volume ratio than the parent cell.
    d. has less DNA in its nucleus than the parent cell.

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

14. The rate at which wastes are produced by a cell depends on the cell’s
    a. surface area.
    b. volume.
    c. ratio of surface area to volume.
    d. environment.

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

16. The process by which a cell divides into two daughter cells is called
    a. mitosis.
    b. cell division.
    c. interphase.
    d. metaphase.

17. During which phase of mitosis do the chromosomes line up along the middle of the dividing cell?
    a. telophase
    b. prophase
    c. metaphase
    d. anaphase

18. Chromosomes form tetrads during
    a. prophase I of meiosis.
    b. interphase.
    c. metaphase I of meiosis.
    d. anaphase II of meiosis.

19. When during the cell cycle are chromosomes visible?
    a. only during the G1 phase
    b. only during cell division
    c. only during interphase
    d. only when they are being replicated

20. By the time a normal cell divides, you can assume that
    a. the cell’s volume has become larger than its surface area.
    b. the cell’s mitochondria have been destroyed.
    c. the cell has replicated all of its DNA.
    d. the cell’s surface area has become larger than its volume.
21. Crossing-over rarely occurs in mitosis, unlike meiosis. Which of the following is the likely reason?
   a. A cell undergoing mitosis does not have homologous chromosomes.
   b. Chromatids are not involved in mitosis.
   c. Tetrads rarely form during mitosis.
   d. There is no prophase during mitosis.

22. All of the following are problems that growth causes for cells EXCEPT
   a. expelling wastes.
   b. DNA overload.
   c. too much oxygen
   d. obtaining enough food.

23. Which pair is correct?
   a. M phase, cell growth
   b. G₁ phase, DNA replication
   c. S phase, cell division
   d. G₂ phase, preparation for mitosis

24. Compared to small cells, large cells have more trouble
   a. moving needed materials in and waste products out.
   b. making cyclin proteins.
   c. producing daughter cells.
   d. dividing.

25. Gametes have
   a. both sets of homologous chromosomes.
   b. twice the number of chromosomes found in body cells.
   c. two sets of chromosomes.
   d. one set of chromosomes

26. As a cell becomes larger, its
   a. volume increases, but its surface area stays the same.
   b. volume increases faster than its surface area.
   c. surface area increases faster than its volume.
   d. surface area stays the same, but its volume increases.

27. The first phase of mitosis is called
   a. interphase.
   b. anaphase.
   c. metaphase.
   d. prophase.

28. Which of the following is a phase of mitosis?
   a. prophase
   b. cytokinesis
   c. S phase
   d. interphase

29. Which of the following is a phase in the cell cycle?
   a. M phase
   b. G₁ phase
   c. G₂ phase
   d. all of the above

30. Which of the following is NOT a correct statement about the events of the cell cycle?
   a. Interphase is usually the longest phase.
   b. Cell division ends with cytokinesis.
   c. The size of the cell increases during the G₂ phase.
   d. DNA replicates during the S phase.
31. What is shown in Figure 11–3?
   a. independent assortment
   b. crossing-over
   c. replication
   d. anaphase I of meiosis

32. Cell division is represented in Figure 10–1 by the letter
   a. A.
   b. D.
   c. B.
   d. C.

33. One difference between cell division in plant cells and in animal cells is that plant cells have
   a. a cell plate.
   b. centromeres.
   c. centrioles.
   d. chromatin.

34. The cell cycle is the
   a. period of time between the birth and the death of a cell.
   b. time it takes for one cell to undergo mitosis.
   c. series of events that cells go through as they grow and divide.
   d. time from prophase until cytokinesis.
35. Which of the following is a correct statement about the events of the cell cycle?
   a. DNA replicates during cytokinesis.
   b. The M phase is usually the longest phase.
   c. Little happens during the G₁ and G₂ phases.
   d. Interphase consists of the G₁, S, and G₂ phases.

36. If an organism’s diploid number is 12, its haploid number is
   a. 24.
   b. 3.
   c. 6.
   d. 12.

37. As a cell grows, it
   a. uses up food and oxygen more quickly.
   b. places more demands on its DNA.
   c. has more trouble moving enough materials across its cell membrane.
   d. all of the above

38. Which of the following is NOT a way that cell division solves the problems of cell growth?
   a. Cell division increases the surface area of the original cell.
   b. Cell division reduces the original cell’s volume.
   c. Cell division increases the mass of the original cell.
   d. Cell division provides each daughter cell with its own copy of DNA.

39. Unlike mitosis, meiosis results in the formation of
   a. four genetically identical cells.
   b. two genetically different cells.
   c. two genetically identical cells.
   d. four genetically different cells.

40. Which of the following happens when a cell divides?
   a. The cell has DNA overload.
   b. The cell’s volume increases.
   c. It becomes more difficult for the cell to get enough oxygen and nutrients.
   d. Each daughter cell receives its own copy of the parent cell’s DNA.