

Name:

Mitosis and Meiosis

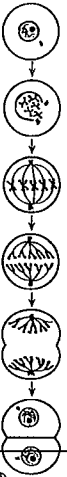
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1. The sequence of events occurring in the life cycle of a bacterium is listed below.

- (A) The bacterium copies its single chromosome.
- (B) The copies of the chromosome attach to the cell membrane of the bacterium.
- (C) As the cell grows, the two copies of the chromosome separate.
- (D) The cell is separated by a wall into equal halves.
- (E) Each new cell has one copy of the chromosome.

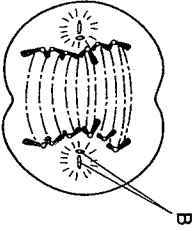
- This sequence most closely resembles the process of
- 1) recombination
 - 2) zygote formation
 - 3) mitotic cell division
 - 4) meiotic cell division

2. Which activity most directly involves the process represented in the diagram below?



- 1) a gamete reproducing sexually
- 2) a white blood cell engulfing bacteria
- 3) a zygote being produced in an ovary
- 4) an animal repairing damaged tissue

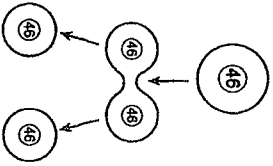
3. The cell in the diagram below illustrates a stage of mitotic cell division.



- Letter *B* indicates the
- 1) paired chromosomes
 - 2) centrioles
 - 3) cell plate
 - 4) endoplasmic reticulum

4. The ability of cells to pass on their characteristics to new cells is most directly related to the ability of
- 1) cytoplasm to excrete wastes
 - 2) effectors to respond to environmental changes
 - 3) ribosomes to use energy
 - 4) chromosomes to replicate

5. The diagram below can be used to illustrate a process directly involved in

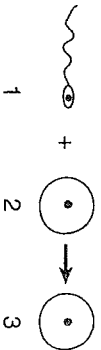


- 1) tissue repair
- 2) meiosis
- 3) recombination
- 4) sexual reproduction

6. Uncontrolled cell division is a characteristic of
- 1) cleavage
 - 2) oogenesis
 - 3) cancer
 - 4) regeneration

7. The presence of a cancerous mass in the lung is a direct result of
- 1) prolonged exposure to very dry air
 - 2) the introduction of toxins through breaks in the skin
 - 3) meiotic division of normal cells
 - 4) the uncontrolled division and growth of abnormal cells

8. Some cells involved in the process of reproduction are represented in the diagram below

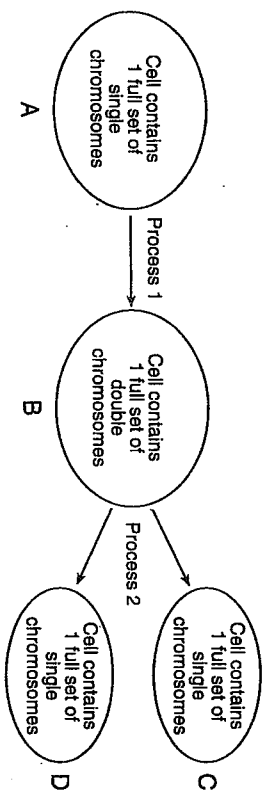


- The process of meiosis formed
- 1) cell 1, only
 - 2) cells 1 and 2
 - 3) cell 3, only
 - 4) cells 2 and 3

9. In human females, how many egg cells are formed as a result of one primary sex cell undergoing normal meiotic cell division?
- 1) 1
 - 2) 2
 - 3) 3
 - 4) 4

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Base your answers to questions 10 through 13 on the diagram below and on your knowledge of biology. The diagram represents a single-celled organism, such as an amoeba, undergoing the changes shown.



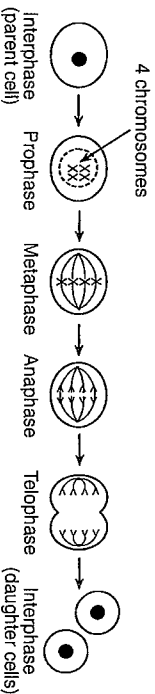
10. Process 1 and process 2 are directly involved in
- 1) meiotic cell division
 - 2) mitotic cell division
 - 3) fertilization
 - 4) recombination

11. Process 1 is known as
- 1) replication
 - 2) meiosis
 - 3) differentiation
 - 4) digestion

12. As a result of these processes, the single-celled organism accomplishes
- 1) genome production
 - 2) energy production
 - 3) sexual reproduction
 - 4) asexual reproduction

13. The genetic content of *C* is usually identical to the genetic content of
- 1) *B* but not *D*
 - 2) both *B* and *D*
 - 3) *D* but not *A*
 - 4) both *A* and *D*

14. The diagram below illustrates the process of cell division.



What is the significance of anaphase in this process?

- 1) Anaphase usually ensures that each daughter cell has the same number of chromosomes as the parent cell.
- 2) Anaphase usually ensures that each daughter cell has twice as many chromosomes as the parent cell.
- 3) In anaphase, the cell splits in half.
- 4) In anaphase, the DNA is being replicated.

15. Down syndrome is a genetic disorder caused by the presence of an extra chromosome in the body cells of humans. This extra chromosome occurs in a gamete as a result of
- 1) an error in the process of cloning
 - 2) an error in meiotic cell division
 - 3) a gene mutation
 - 4) replication of a single chromosome during mitosis

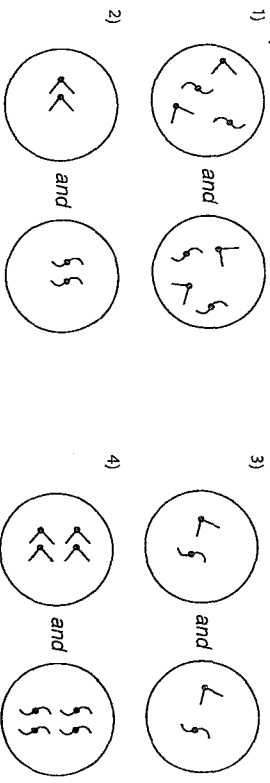
16. Most cells in the body of a fruit fly contain eight chromosomes. In some cells, only four chromosomes are present, a condition which is a direct result of
- 1) mitotic cell division
 - 2) meiotic cell division
 - 3) embryonic differentiation
 - 4) internal fertilization

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17. The chromosome content of a skin cell that is about to form two new skin cells is represented in the diagram below.



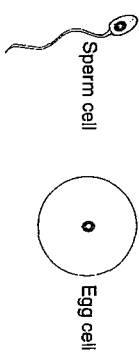
Which diagram best represents the chromosomes that would be found in the two new skin cells produced as a result of this process?



18. Which statement correctly describes the genetic makeup of the sperm cells produced by a human male?

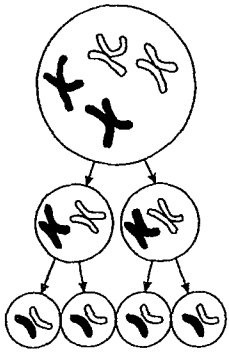
- 1) Each cell has pairs of chromosomes and the cells are usually genetically identical.
- 2) Each cell has pairs of chromosomes and the cells are usually genetically different.
- 3) Each cell has half the normal number of chromosomes and the cells are usually genetically identical.
- 4) Each cell has half the normal number of chromosomes and the cells are usually genetically different.

19. The diagram below represents two human cells.



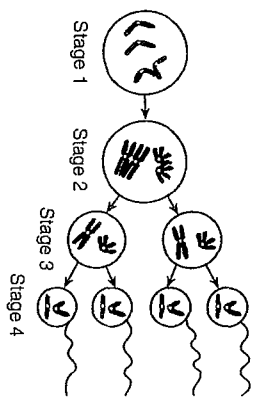
- These cells are a direct result of
- 1) mitotic cell division
 - 2) sex linkage
 - 3) fertilization
 - 4) gametogenesis

20. The distribution of chromosomes in one type of cell division is shown in the diagram below.



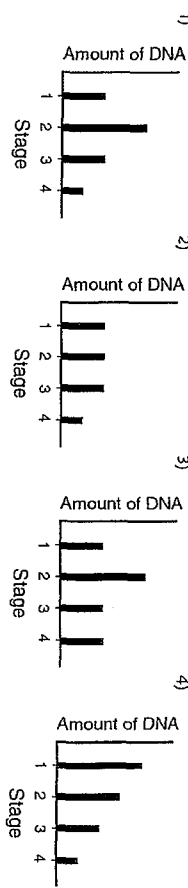
- Which process is represented in the diagram?
- 1) asexual reproduction
 - 2) meiosis
 - 3) mitosis
 - 4) vegetative propagation
21. Which process produces polar bodies that eventually degenerate?
- 1) oogenesis
 - 2) spermatogenesis
 - 3) cyclosis
 - 4) cleavage

22. The diagram below illustrates some of the changes that occur during gamete formation.

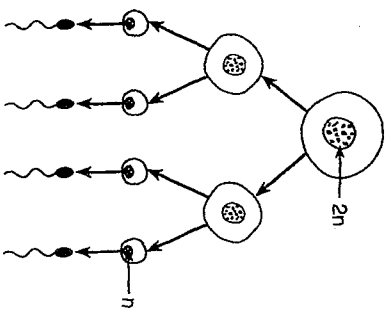


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Which graph best represents the changes in the amount of DNA in one of the cells at each stage?

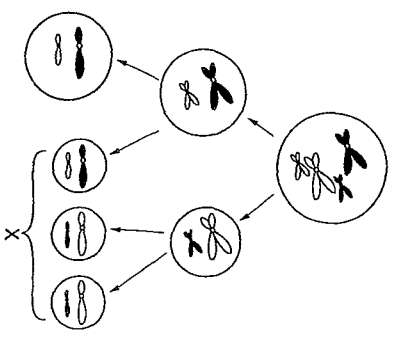


23. Base your answer to the following question on the diagram below, which represents a necessary part of human reproduction.



- This diagram represents the process of
- 1) ovulation
 - 2) gastrulation
 - 3) mitotic cell division
 - 4) gametogenesis

24. The diagram below represents a reproductive process.



- The three structures indicated by letter X are known as
- 1) ova
 - 2) embryos
 - 3) polar bodies
 - 4) homologous chromosomes

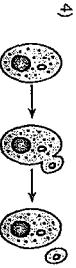
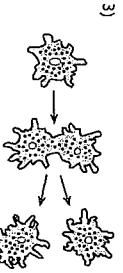
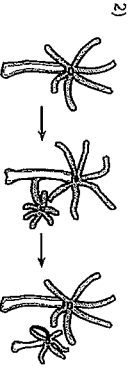
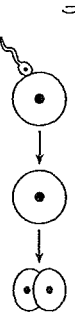
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25. The process of meiotic cell division in a human male usually forms
- 1) one diploid cell, only
 - 2) four diploid cells
 - 3) one monoploid cell, only
 - 4) four monoploid cells
26. Each body cell of a chimpanzee contains 48 chromosomes. How many chromosomes would normally be present in a gamete produced by this chimpanzee?
- 1) 24
 - 2) 36
 - 3) 48
 - 4) 96
27. In an environment that undergoes frequent change, species that reproduce sexually may have an advantage over species that reproduce asexually because the sexually reproducing species produce
- 1) more offspring in each generation
 - 2) identical offspring
 - 3) offspring with more variety
 - 4) new species of offspring in each generation
28. Which statement is true of both mitosis and meiosis?
- 1) Both are involved in asexual reproduction.
 - 2) Both occur only in reproductive cells.
 - 3) The number of chromosomes is reduced by half.
 - 4) DNA replication occurs before the division of the nucleus.
29. Compared to human cells resulting from mitotic cell division, human cells resulting from meiotic cell division would have
- 1) twice as many chromosomes
 - 2) the same number of chromosomes
 - 3) one-half the number of chromosomes
 - 4) one-quarter as many chromosomes
30. The great variety of possible gene combinations in a sexually reproducing species is due in part to the
- 1) sorting of genes as a result of gene replication
 - 2) pairing of genes as a result of mitosis
 - 3) pairing of genes as a result of differentiation
 - 4) sorting of genes as a result of meiosis
31. Which process normally occurs during meiosis, but *not* during mitosis?
- 1) chromosomal replication
 - 2) synapsis of chromosomes
 - 3) spindle formation
 - 4) centromere replication

32. The chromosome number of a cell produced by mitotic cell division is represented by $2n$. If that cell had been produced by meiotic cell division, its chromosome number would be represented by
- 1) $\frac{n}{2}$
 - 2) n
 - 3) $2n$
 - 4) $4n$

33. The sorting and recombining of genes during meiosis and fertilization usually leads to the production of
- 1) gametes with many copies of the same chromosome
 - 2) embryos with traits identical to those of all other members of the species
 - 3) zygotes with the genetic information to produce only females
 - 4) offspring with some traits that did not appear in their parents

34. Which process usually results in offspring that exhibit new genetic variations?



35. Which statement best describes a population of organisms if cloning is the only method used to reproduce this population?
- 1) The population would be more likely to adapt to a changing environment.
 - 2) There would be little chance for variation within the population.
 - 3) The population would evolve rapidly.
 - 4) The mutation rate in the population would be rapid.

