

Mitosis Quiz Questions and Answers PDF

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Which phase of mitosis involves the alignment of chromosomes at the cell's equatorial plane?

- Prophase
- Metaphase ✓
- Anaphase
- Telophase

During the metaphase of mitosis, chromosomes align at the cell's equatorial plane, preparing for separation. This alignment is crucial for ensuring that each daughter cell receives an identical set of chromosomes.

In which phase do sister chromatids separate and move to opposite poles?

- Prophase
- Metaphase
- Anaphase ✓
- Telophase

Sister chromatids separate during the anaphase of mitosis and meiosis, moving towards opposite poles of the cell. This is a crucial step in ensuring that each daughter cell receives an identical set of chromosomes.

Which of the following is NOT a phase of mitosis?

- Interphase ✓
- Prophase
- Metaphase
- Telophase

The phases of mitosis include prophase, metaphase, anaphase, and telophase. Any option that does not correspond to these phases, such as interphase, is NOT a phase of mitosis.

What structure forms in plant cells during cytokinesis?

- Cleavage furrow
- Cell plate** ✓
- Spindle fiber
- Centromeres

During cytokinesis in plant cells, a structure known as the cell plate forms, which eventually develops into the new cell wall separating the two daughter cells.

Which structures are involved in the separation of sister chromatids? (Select all that apply)

- Spindle fibers** ✓
- Centromeres** ✓
- Ribosomes
- Golgi apparatus

The structures involved in the separation of sister chromatids include the spindle fibers and the centromeres. These components work together during cell division to ensure that each daughter cell receives an identical set of chromosomes.

Which checkpoints are involved in the regulation of the cell cycle? (Select all that apply)

- G1 checkpoint** ✓
- S checkpoint
- G2 checkpoint** ✓
- M phase checkpoint** ✓

The cell cycle is regulated by several key checkpoints, including the G1 checkpoint, the G2 checkpoint, and the M checkpoint. These checkpoints ensure that the cell is ready to proceed to the next phase of the cycle and help prevent errors such as DNA damage or incomplete replication.

Which phases are part of the M phase in the cell cycle? (Select all that apply)

- Prophase** ✓
- Interphase
- Metaphase** ✓
- Cytokinesis** ✓

The M phase of the cell cycle includes both mitosis and cytokinesis, which are essential for cell division. During this phase, the cell's chromosomes are separated and distributed into two daughter cells.

During which phase does the nuclear envelope begin to disintegrate?

- Prophase ✓
- Metaphase
- Anaphase
- Telophase

The nuclear envelope begins to disintegrate during the prophase of mitosis. This phase marks the transition where chromatin condenses into visible chromosomes and the nuclear membrane breaks down to allow spindle fibers to access the chromosomes.

What is the primary purpose of mitosis in multicellular organisms?

- Sexual reproduction
- Genetic variation
- Growth and repair ✓
- Energy production

The primary purpose of mitosis in multicellular organisms is to enable growth, repair, and asexual reproduction by producing two genetically identical daughter cells from a single parent cell.

Which structure is responsible for organizing the mitotic spindle?

- Chromosome
- Centromeres
- Centrosome ✓
- Ribosome

The mitotic spindle is organized by the centrosomes, which serve as the main microtubule-organizing centers during cell division. They play a crucial role in ensuring proper chromosome alignment and separation during mitosis.

How does mitosis differ from meiosis? (Select all that apply)

- Mitosis results in two identical cells ✓
- Meiosis results in four genetically diverse cells ✓
- Mitosis is involved in sexual reproduction
- Meiosis is involved in growth and repair

The key differences between mitosis and meiosis include that mitosis results in two identical daughter cells, while meiosis produces four genetically diverse gametes. Additionally, meiosis involves two rounds of cell division and includes processes like crossing over, which do not occur in mitosis.

Which of the following events occur during prophase? (Select all that apply)

- Chromatin condenses into chromosomes ✓**
- Chromosomes align at the metaphase plate
- Nuclear envelope disintegrates ✓**
- Spindle fibers attach to centromeres

During prophase, chromatin condenses into visible chromosomes, the nuclear envelope begins to break down, and the mitotic spindle starts to form. These events are crucial for the proper segregation of chromosomes during cell division.

What is the result of mitosis in terms of the number of cells produced?

- One identical cell
- Two identical cells ✓**
- Four identical cells
- Four genetically diverse cells

The process of mitosis results in the production of two genetically identical daughter cells from a single parent cell. This is a crucial mechanism for growth, repair, and asexual reproduction in organisms.

What are the functions of mitosis in an organism? (Select all that apply)

- Growth ✓**
- Repair ✓**
- Sexual reproduction
- Asexual reproduction ✓**

The functions of mitosis in an organism include growth, tissue repair, and asexual reproduction. It ensures that each daughter cell receives an identical set of chromosomes, maintaining genetic consistency.