

Chapter 4 — Cell Cycle

60 Fully Solved Multiple Choice Questions

Class 9 • Biology • Mitosis & Meiosis

✓ Answers Marked

📖 With Explanations

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How to use this booklet: Each question box below contains four options. The **correct option** is highlighted in green with a ✓ tick mark, and a short explanation is given right after the options so you can revise the concept instantly. Covers: Cell Cycle, Interphase (G1, S, G2, G0), Mitosis (Prophase, Metaphase, Anaphase, Telophase, Cytokinesis), Significance & Errors of Mitosis, Meiosis-I & Meiosis-II, Significance & Errors of Meiosis, and Comparison between Mitosis & Meiosis.

Q1

MCQ

What is the 'cell cycle'?

A A random set of events inside a cell

✓ B The series of events that take place in a eukaryotic cell from its formation to its division into two daughter cells

C Only the process of mitosis

D Only the process of DNA replication

✓ **Correct Answer:** Option B

Explanation: The cell cycle is defined as the series of events that occur in a eukaryotic cell from its formation to its division into two daughter cells.

Reference: scholareye.xyz

Q2

MCQ

The eukaryotic cell cycle is mainly divided into which two phases?

A Mitosis and Meiosis

✓ B Interphase and the Mitosis (M) phase

C G1 and G2 phase

D Synthesis and Cytokinesis

✓ **Correct Answer:** Option B

Explanation: The cell cycle can be divided into two main phases: Interphase and the Mitosis phase.

Reference: scholareye.xyz

Q3

MCQ

Approximately what percentage of the total cell cycle time is occupied by interphase?

A 10%

B 50%

✓ C 90%

D 25%

✓ **Correct Answer:** Option C

Explanation: Interphase lasts for about 90% of the total time of the cell cycle.

Reference: scholareye.xyz

Q4

MCQ

Interphase is subdivided into which three phases?

A Prophase, Metaphase, Anaphase

✓ B G1, S and G2 phases

C G0, G1 and M phases

D Synapsis, Crossing over, Disjunction

✓ **Correct Answer:** Option B

Explanation: Interphase consists of three phases: G1 (First Gap), S (Synthesis) and G2 (Second Gap) phase.

Reference: scholareye.xyz

Q5

MCQ

During which phase does the cell make proteins and organelles and increase in size, also producing enzymes needed for DNA replication?

A S phase

✓ B G1 phase

C G2 phase

D M phase

✓ **Correct Answer:** Option B

Explanation: G1 (First Gap) phase is the growth phase, during which the cell makes proteins, organelles, grows in size, and makes enzymes required in S phase for DNA replication.

Reference: scholareye.xyz

Q6

MCQ

DNA replication (duplication of chromosomes) occurs during which phase of the cell cycle?

A G1 phase

✓ B S phase

C G2 phase

D M phase

✓ **Correct Answer:** Option B

Explanation: The S (Synthesis) phase is when the DNA of each chromosome is replicated, resulting in each chromosome consisting of two sister chromatids.

Reference: scholareye.xyz

Q7

MCQ

After DNA replication in the S phase, each chromosome consists of:

A One chromatid

✓ B Two sister chromatids

C Four chromatids

D No chromatid

✓ **Correct Answer:** Option B

Explanation: As a result of replication in the S phase, each chromosome consists of two sister chromatids, though the total number of chromosomes in the cell remains the same.

Reference: scholareye.xyz

Q8

MCQ

During which phase does the cell check for DNA damage, make repairs, and prepare for mitosis?

A G1 phase

B S phase

✓ C G2 phase

D G0 phase

✓ **Correct Answer:** Option C

Explanation: During G2 (Second Gap) phase, the cell continues to grow, produces proteins necessary for cell division, checks for DNA damage and makes repairs, and reorganizes its contents for mitosis.

Reference: scholareye.xyz

Q9

MCQ

Which phase is also known as the 'growth phase' and starts right after the M phase of the previous cycle?

A S phase

B G2 phase

✓ C G1 phase

D G0 phase

✓ **Correct Answer:** Option C

Explanation: G1 Phase (First Gap Phase) starts from the end of the mitosis phase and is also called the growth phase.

Reference: scholareye.xyz

Q10

MCQ

Cells that stop dividing and start performing their specialized functions are said to enter which phase?

A G1 phase

B S phase

✓ C G0 phase

D G2 phase

✓ **Correct Answer:** Option C

Explanation: The G0 phase is when many cells stop dividing and start performing their specific functions instead of continuing through the cycle.

Reference: scholareye.xyz

Q11

MCQ

Which of the following cell types remains in the G0 phase for an indefinite period?

A Skin cells

✓ B Neurons

C Epithelial cells

D Liver cells

✓ **Correct Answer:** Option B

Explanation: Neurons (nerve cells) remain in the G0 phase for indefinite periods, as they generally do not divide again once mature.

Reference: scholareye.xyz

Q12

MCQ

Which cells remain in the G0 phase only temporarily and can re-enter the cell cycle if needed?

A Neurons

✓ B Liver and kidney cells

C Epithelial cells of skin

D Cardiac muscle cells

✓ **Correct Answer:** Option B

Explanation: Cells of the liver and kidney remain in the G0 phase temporarily; they can resume dividing (for example, during tissue repair) when required.

Reference: scholareye.xyz

Q13

MCQ

Which of the following cell types does NOT enter G0 and instead continues to divide throughout life?

A Neurons

B Liver cells

✓ C Epithelial cells

D Kidney cells

✓ **Correct Answer:** Option C

Explanation: Epithelial cells do not enter the G0 phase and continue to divide throughout life to replace worn-out cells.

Reference: scholareye.xyz

Q14

MCQ

The German biologist who discovered the events of mitosis in the 1880s was:

A Oscar Hertwig

✓ B Walther Flemming

C Gregor Mendel

D Robert Hooke

✓ **Correct Answer:** Option B

Explanation: Walther Flemming, a German biologist, discovered the events of mitosis in the 1880s.

Reference: scholareye.xyz

Q15

MCQ

Mitosis produces daughter cells that have:

- A Half the chromosome number of the parent cell
- ✓ B The same number of chromosomes as the parent cell
- C Double the chromosome number of the parent cell
- D No chromosomes at all

✓ **Correct Answer:** Option B

Explanation: Mitosis is the type of cell division in which a cell divides into two daughter cells, each with the same number of chromosomes as the parent cell.

Reference: scholareye.xyz

Q16

MCQ

Mitosis normally occurs in which type of cells in eukaryotes?

- A Germ cells
- ✓ B Somatic cells
- C Gametes only
- D Spore mother cells only

✓ **Correct Answer:** Option B

Explanation: Mitosis occurs in the somatic (body) cells of eukaryotes.

Reference: scholareye.xyz

Q17

MCQ

The division of the nucleus during mitosis is called:

A Cytokinesis

✓ B Karyokinesis

C Synapsis

D Disjunction

✓ **Correct Answer:** Option B

Explanation: Karyokinesis means the division of the nucleus, and it is further divided into four phases.

Reference: scholareye.xyz

Q18

MCQ

Karyokinesis (nuclear division) in mitosis is divided into how many phases?

A Two

B Three

✓ C Four

D Five

✓ **Correct Answer:** Option C

Explanation: Karyokinesis is divided into four phases: prophase, metaphase, anaphase, and telophase.

Reference: scholareye.xyz

Q19

MCQ

During which phase of mitosis does the thread-like chromatin condense into visible chromosomes and does the nuclear envelope break down?

A Metaphase

✓ **B** Prophase

C Anaphase

D Telophase

✓ **Correct Answer:** Option B

Explanation: During prophase, chromatin condenses into visible chromosomes, and the nuclear envelope and nucleolus break down.

Reference: scholareye.xyz

Q20

MCQ

In plant cells, which lack centrosomes, the mitotic spindle is formed by:

A Duplication of centrioles

✓ **B** Aggregation of spindle fibres present in the cytoplasm

C The nuclear envelope

D The Golgi apparatus

✓ **Correct Answer:** Option B

Explanation: Plant cells have no centrosome; their mitotic spindle is instead formed by the aggregation of spindle fibres present in the cytoplasm.

Reference: scholareye.xyz

Q21

MCQ

During metaphase, spindle fibres bind to chromosomes at a special point called the:

A Telomere

✓ **B Centromere (kinetochore)**

C Sister chromatid tip

D Nucleolus

✓ **Correct Answer:** Option B

Explanation: During metaphase, spindle fibres bind with chromosomes at the point of the centromere, where special kinetochore proteins are present.

Reference: scholareye.xyz

Q22

MCQ

The plate formed when chromosomes align at the equator of the cell during metaphase is called the:

A Cell plate

✓ **B Metaphase plate**

C Anaphase plate

D G1 plate

✓ **Correct Answer:** Option B

Explanation: When chromosomes attached with spindle fibres arrange themselves along the equator of the cell, a plate is formed called the metaphase plate.

Reference: scholareye.xyz

Q23

MCQ

During anaphase of mitosis, what happens to the sister chromatids of each chromosome?

A They fuse together permanently

✓ **B** They separate and move toward opposite poles

C They condense further without moving

D They form a tetrad

✓ **Correct Answer:** Option B

Explanation: During anaphase, spindle fibres attached to chromosomes pull toward the poles; due to this pulling, sister chromatids separate and move toward opposite poles.

Reference: scholareye.xyz

Q24

MCQ

During telophase, what happens around each set of separated chromosomes?

A A cell plate forms immediately

✓ **B** A new nuclear envelope forms and chromosomes unfold into chromatin

C DNA replication begins again

D Crossing over occurs

✓ **Correct Answer:** Option B

Explanation: In telophase, a new nuclear envelope forms around each set of separated chromosomes and nucleolus reforms; both sets of chromosomes unfold back into chromatin.

Reference: scholareye.xyz

Q25

MCQ

In animal cell cytokinesis, the cleavage furrow develops due to a contracting ring of:

A Microtubules

✓ **B** Microfilaments

C Chromatids

D Golgi vesicles

✓ **Correct Answer:** Option B

Explanation: In animal cells, a furrow develops in the cell membrane at the equator, formed by a ring of microfilaments; the ring contracts and the furrow moves inward, pinching the parent cell into two.

Reference: scholareye.xyz

Q26

MCQ

In plant cell cytokinesis, vesicles made by the Golgi apparatus fuse to form a structure called the:

A Cleavage furrow

✓ **B** Phragmoplast (cell plate)

C Metaphase plate

D Kinetochore

✓ **Correct Answer:** Option B

Explanation: In plant cells, the Golgi apparatus makes vesicles that move to the middle and fuse to form a plate called the phragmoplast (cell plate), which grows outward until it fuses with the cell membrane.

Reference: scholareye.xyz

Q27

MCQ

Mitosis contributes to growth in multicellular organisms mainly by:

A Reducing the chromosome number in cells

✓ **B** Increasing the number of cells in the body

C Producing gametes for reproduction

D Creating new genetic combinations

✓ **Correct Answer:** Option B

Explanation: Growth in organisms means an increase in size, which occurs due to an increase in the number of cells produced through mitosis.

Reference: scholareye.xyz

Q28

MCQ

The continuous replacement of dying red blood cells and skin cells in the body is an example of the role of:

A Meiosis

✓ **B** Mitosis

C Non-disjunction

D Synapsis

✓ **Correct Answer:** Option B

Explanation: Mitosis is responsible for cell replacement; dying cells such as red blood cells and cells of the skin and intestinal walls are replaced by new, identical cells formed through mitosis.

Reference: scholareye.xyz

Q29

MCQ

Regeneration of a lost arm in a sea star occurs through the process of:

A Meiosis

✓ **B** Mitosis

C Crossing over

D Disjunction

✓ **Correct Answer:** Option B

Explanation: Regeneration, such as a sea star regrowing a broken arm, occurs through mitosis, which forms new cells for the regenerating part.

Reference: scholareye.xyz

Q30

MCQ

Hydra reproducing asexually by forming a bud on its body surface relies on which process?

A Meiosis

✓ **B** Mitosis

C Fertilization

D Synapsis

✓ **Correct Answer:** Option B

Explanation: In asexual reproduction, such as budding in Hydra, mitosis forms a mass of cells (a bud) on the surface of the parent, which grows into a new individual.

Reference: scholareye.xyz

Q31

MCQ

If sister chromatids of a chromosome fail to separate during the anaphase of mitosis, the likely result is that:

A Both daughter cells receive a normal chromosome set

✓ **B** One daughter cell receives both sister chromosomes and the other receives none

C Both daughter cells receive no chromosomes

D The cell simply stops dividing with no other effect

✓ **Correct Answer:** Option B

Explanation: If sister chromatids fail to separate during anaphase, one daughter cell receives both sister chromosomes while the other receives none, which is an error in mitosis.

Reference: scholareye.xyz

Q32

MCQ

Masses of cells formed due to uncontrolled cell division caused by mutated genes that regulate mitosis are called:

A Tetrads

✓ **B** Tumors

C Chromatids

D Spores

✓ **Correct Answer:** Option B

Explanation: If genes that regulate mitosis are mutated, cells continue to divide uncontrollably, forming masses of cells called tumors.

Reference: scholareye.xyz

Q33

MCQ

A tumor that stays in its original location and does not spread is described as:

A Malignant

✓ B Benign

C Metastatic

D Haploid

✓ **Correct Answer:** Option B

Explanation: If tumors remain in their original location, they are called benign tumors.

Reference: scholareye.xyz

Q34

MCQ

A tumor that migrates and invades other tissues of the body is called a:

A Benign tumor

✓ B Malignant tumor (cancer)

C G0 tumor

D Diploid tumor

✓ **Correct Answer:** Option B

Explanation: If tumors migrate and invade other tissues, they are called malignant tumors, also known as cancer.

Reference: scholareye.xyz

Q35

MCQ

The spreading of cancer from its original site to other parts of the body is termed:

A Synapsis

✓ **B Metastasis**

C Crossing over

D Disjunction

✓ **Correct Answer:** Option B

Explanation: Metastasis refers to the spreading of disease (cancer) as malignant tumor cells invade and migrate to other tissues.

Reference: scholareye.xyz

Q36

MCQ

Meiosis is the type of cell division in which each daughter cell receives:

A The same number of chromosomes as the parent cell

✓ **B Half the number of chromosomes compared to the parent cell**

C Double the chromosomes of the parent cell

D No chromosomes

✓ **Correct Answer:** Option B

Explanation: In meiosis, a diploid parent cell divides to produce four haploid daughter cells, each with half the number of chromosomes of the parent cell.

Reference: scholareye.xyz

Q37

MCQ

A 'diploid' cell is one in which chromosomes are present as:

A Single unpaired sets

✓ B Homologous pairs

C Random fragments

D Triplets

✓ **Correct Answer:** Option B

Explanation: Diploid means the cells in which chromosomes are present in pairs, known as homologous pairs.

Reference: scholareye.xyz

Q38

MCQ

A 'haploid' cell contains:

A Chromosomes in homologous pairs

✓ B Half the number of chromosomes, with no pairs

C Double the normal chromosome number

D No DNA at all

✓ **Correct Answer:** Option B

Explanation: Haploid means cells with half the number of chromosomes, i.e., cells with no pairs of chromosomes.

Reference: scholareye.xyz

Q39

MCQ

The German biologist Oscar Hertwig discovered meiosis in which year?

A 1865

✓ B 1876

C 1880

D 1900

✓ **Correct Answer:** Option B

Explanation: Meiosis was discovered in 1876 by the German biologist Oscar Hertwig.

Reference: scholareye.xyz

Q40

MCQ

Meiosis consists of how many successive divisions?

A One

✓ B Two (Meiosis-I and Meiosis-II)

C Three

D Four

✓ **Correct Answer:** Option B

Explanation: Meiosis consists of two divisions: Meiosis-I and Meiosis-II.

Reference: scholareye.xyz

Q41

MCQ

During prophase-I of meiosis, homologous chromosomes move together and pair up in a process called:

A Crossing over

✓ **B Synapsis**

C Disjunction

D Cytokinesis

✓ **Correct Answer:** Option B

Explanation: In prophase-I, homologous chromosomes move close together and pair up in a process called synapsis.

Reference: scholareye.xyz

Q42

MCQ

Each paired set of homologous chromosomes formed during synapsis is called a:

A Chromatid

✓ **B Tetrad**

C Centromere

D Kinetochore

✓ **Correct Answer:** Option B

Explanation: Each pair of homologous chromosomes joined together during synapsis is called a tetrad, since it consists of four chromatids.

Reference: scholareye.xyz

Q43

MCQ

The X-shaped structures formed at the sites of crossing over between non-sister chromatids are called:

✓ **A Chiasmata**

B Tetrads

C Centromeres

D Spindles

✓ **Correct Answer:** Option A

Explanation: Non-sister chromatids of homologous chromosomes become 'zipped' together, forming X-shaped structures called chiasmata, which are the sites of crossing over.

Reference: scholareye.xyz

Q44

MCQ

Crossing over during prophase-I is significant because it leads to:

A Loss of genetic material

✓ **B Recombination of genetic material**

C Doubling of chromosome number

D Cell death

✓ **Correct Answer:** Option B

Explanation: Crossing over is the exchange of portions of DNA between non-sister chromatids, which leads to recombination of genetic material.

Reference: scholareye.xyz

Q45

MCQ

During metaphase-I of meiosis, spindle fibres from both poles attach to:

A A single chromosome

✓ **B** One pair of homologous chromosomes (a tetrad)

C Sister chromatids only

D Centrioles

✓ **Correct Answer:** Option B

Explanation: In the metaphase plate of meiosis-I, two spindle fibres from both poles attach with one pair of homologous chromosomes, forming the metaphase plate.

Reference: scholareye.xyz

Q46

MCQ

During anaphase-I of meiosis, what is pulled apart toward opposite poles?

A Sister chromatids of a single chromosome

✓ **B** The paired homologous chromosomes

C Only the centromeres

D The nucleoli

✓ **Correct Answer:** Option B

Explanation: During anaphase-I, each spindle fibre attached with a single chromosome pulls toward the pole, separating the paired homologous chromosomes; each chromosome still contains two sister chromatids.

Reference: scholareye.xyz

Q47

MCQ

By the end of telophase-I, the cell has formed two haploid sets in which each chromosome still has:

A Only one chromatid

✓ **B Two sister chromatids**

C Four chromatids

D No chromatid

✓ **Correct Answer:** Option B

Explanation: At telophase-I, two haploid sets of chromosomes are formed, and each chromosome in these sets still contains two sister chromatids.

Reference: scholareye.xyz

Q48

MCQ

Meiosis-II, which consists of prophase-II, metaphase-II, anaphase-II and telophase-II, closely resembles:

A Meiosis-I

✓ **B Mitosis**

C Interphase

D Synapsis

✓ **Correct Answer:** Option B

Explanation: Meiosis-II closely resembles mitosis in its sequence of phases and events.

Reference: scholareye.xyz

Q49

MCQ

During anaphase-II of meiosis, what separates and moves toward opposite poles?

A Homologous chromosomes

✓ **B** Sister chromatids

C Tetrads

D Centrosomes

✓ **Correct Answer:** Option B

Explanation: In anaphase-II, spindle fibres pull sister chromatids apart toward opposite poles, similar to anaphase in mitosis.

Reference: scholareye.xyz

Q50

MCQ

At the completion of both meiotic divisions, one diploid parent cell ultimately produces:

A Two diploid daughter cells

✓ **B** Four haploid daughter cells

C One diploid cell

D Four diploid daughter cells

✓ **Correct Answer:** Option B

Explanation: Meiosis (Meiosis-I followed by Meiosis-II) results in the formation of four haploid daughter cells, each with half the number of chromosomes.

Reference: scholareye.xyz

Q51

MCQ

In animals, the haploid daughter cells produced by meiosis in reproductive organs are called:

A Spores

✓ B Gametes

C Zygotes

D Somatic cells

✓ **Correct Answer:** Option B

Explanation: In animals, special cells in reproductive organs undergo meiosis to produce daughter cells called gametes, which have half the number of chromosomes.

Reference: scholareye.xyz

Q52

MCQ

In flowering plants, the haploid daughter cells produced by meiosis in flowers are called:

A Gametes

✓ B Spores

C Zygotes

D Chromatids

✓ **Correct Answer:** Option B

Explanation: In flowering plants, specialized cells in flowers undergo meiosis to produce daughter cells called spores, which grow into a new generation that later produces gametes by mitosis.

Reference: scholareye.xyz

Q53

MCQ

Meiosis helps maintain a constant chromosome number across generations mainly because:

A Mitosis doubles the chromosome number before meiosis begins

✓ **B Male and female haploid gametes fuse to restore the diploid number in the zygote**

C Chromosomes never separate during meiosis

D The chromosome number decreases with every generation

✓ **Correct Answer:** Option B

Explanation: During sexual reproduction, male and female gametes (each haploid) join to form the zygote, restoring the original diploid chromosome number, which is why meiosis maintains chromosome number across generations.

Reference: scholareye.xyz

Q54

MCQ

Genetic diversity produced by meiosis mainly arises from:

A The G0 phase of the cell cycle

✓ **B Crossing over and the random combination of chromosomes into gametes**

C DNA replication alone

D Mitosis in somatic cells

✓ **Correct Answer:** Option B

Explanation: Meiosis brings genetic diversity mainly through crossing over, which creates new gene combinations, and through the random assortment of chromosomes into gametes.

Reference: scholareye.xyz

Q55

MCQ

The failure of homologous chromosomes or sister chromatids to separate properly during meiosis is called:

A Synapsis

✓ **B Non-disjunction**

C Crossing over

D Cytokinesis

✓ **Correct Answer:** Option B

Explanation: Sometimes, during meiosis-I or meiosis-II, chromosomes or chromatids fail to separate properly; this error is called non-disjunction.

Reference: scholareye.xyz

Q56

MCQ

A likely consequence of non-disjunction during meiosis is that resulting gametes may have:

A A completely normal chromosome number

✓ **B An abnormal (more or less than normal) chromosome number**

C No genetic material at all

D Extra centrioles only, with normal chromosomes

✓ **Correct Answer:** Option B

Explanation: Due to non-disjunction, daughter cells (gametes) may receive more or less than the normal number of chromosomes; if such gametes fuse and develop, the offspring may suffer severe medical problems.

Reference: scholareye.xyz

Q57

MCQ

Meiosis, unlike mitosis, occurs specifically in which type of cells?

A Somatic cells only

✓ **B** Germ line cells

C Skin cells

D Muscle cells

✓ **Correct Answer:** Option B

Explanation: According to the comparison table, meiosis occurs in germ line cells, while mitosis occurs in somatic cells.

Reference: scholareye.xyz

Q58

MCQ

Which of the following is a similarity between mitosis and meiosis?

A Both produce four daughter cells

✓ **B** DNA replication occurs during interphase (S phase) before both divisions

C Both reduce the chromosome number by half

D Both occur only in reproductive organs

✓ **Correct Answer:** Option B

Explanation: One key similarity is that DNA replication occurs during interphase (S phase) before both mitosis and meiosis begin.

Reference: scholareye.xyz

Q59

MCQ

Regarding chromosome pairing, which statement correctly distinguishes mitosis from meiosis?

A In both, homologous chromosomes form pairs

✓ **B** In mitosis, homologous chromosomes do not pair up, but in meiosis they form pairs and undergo synapsis

C In mitosis, homologous chromosomes pair up, but not in meiosis

D Neither process involves homologous chromosomes

✓ **Correct Answer:** Option B

Explanation: In mitosis, homologous chromosomes do not form pairs, whereas in meiosis, homologous chromosomes pair up (synapsis) and may undergo crossing over.

Reference: scholareye.xyz

Q60

MCQ

Comparing anaphase events: in mitosis, individual chromatids are pulled to poles, while in anaphase-I of meiosis:

A Chromatids also separate individually

✓ **B** Whole (paired) homologous chromosomes are pulled toward opposite poles

C No separation occurs at all

D Chromosomes fuse together

✓ **Correct Answer:** Option B

Explanation: During anaphase of mitosis, chromatids separate and move individually, whereas during anaphase-I of meiosis, whole homologous chromosomes (each still with two chromatids) are pulled toward opposite poles.

Reference: scholareye.xyz