

# 5.2 Chromosome Behaviour in Mitosis

## Question Paper

Course	CIE A Level Biology (9700) exams from 2022
Section	5. The Mitotic Cell Cycle
Topic	5.2 Chromosome Behaviour in Mitosis
Difficulty	Medium

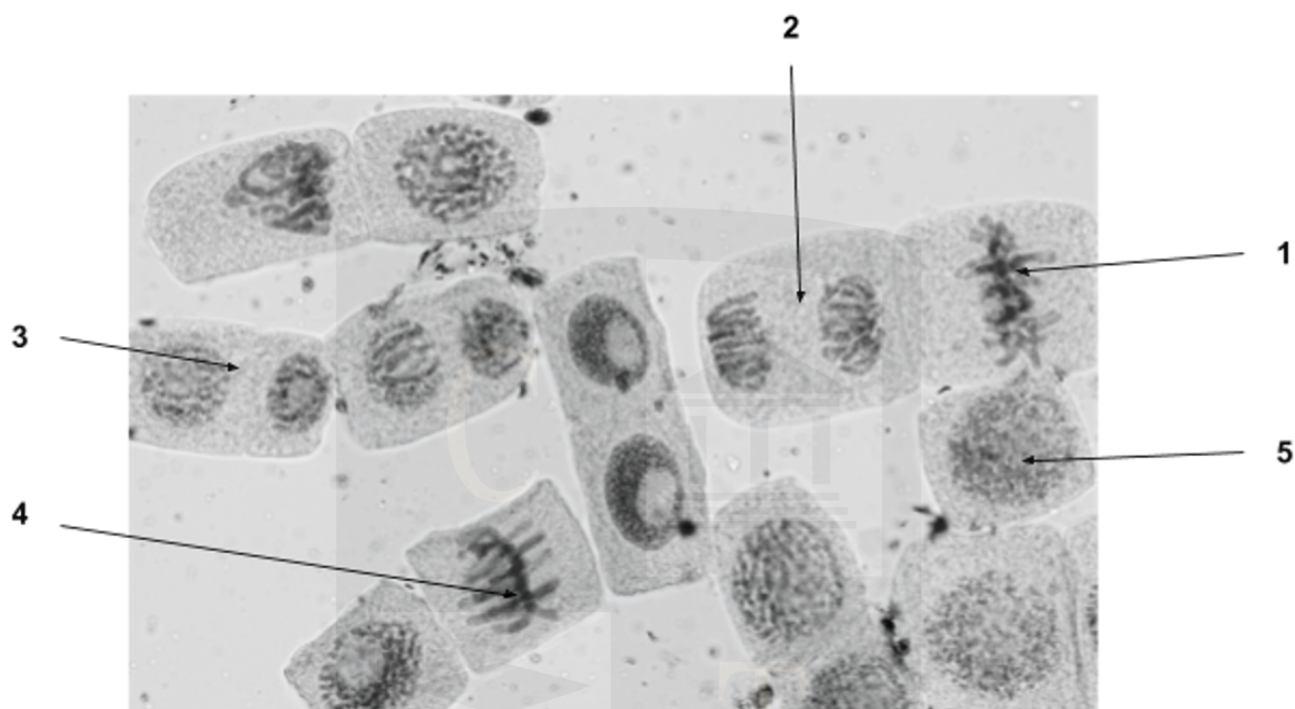
**Time allowed:** 10

**Score:** /10

**Percentage:** /100

### Question 1

The photomicrograph shows cells in different stages of mitosis.



In which order do these stages occur?

- A**     $4 \rightarrow 1 \rightarrow 3 \rightarrow 2 \rightarrow 5$
- B**     $4 \rightarrow 1 \rightarrow 2 \rightarrow 3 \rightarrow 5$
- C**     $4 \rightarrow 3 \rightarrow 5 \rightarrow 1 \rightarrow 2$
- D**     $4 \rightarrow 5 \rightarrow 1 \rightarrow 2 \rightarrow 3$

[1 mark]

## Question 2

Each of the following events takes place during mitosis.

- 1 Chromosomes uncoil
- 2 Chromatids move to opposite poles of the cell
- 3 Centromeres divide
- 4 Chromosomes line up along the equator of the spindle
- 5 Two chromatids are joined by a centromere

In which order do the events take place?

	First	→				Last
<b>A</b>	1	2	4	5		3
<b>B</b>	3	1	2	4		5
<b>C</b>	4	5	3	1		2
<b>D</b>	5	4	3	2		1

[1 mark]

## Question 3

The mitotic spindle has a key role in mitosis.

What macromolecule is the spindle made from?

- A** nucleic acid
- B** polypeptide
- C** phospholipid
- D** polysaccharide

[1 mark]

#### Question 4

The diagram shows the chromosomes of a squashed cell during mitosis.



Which stage of mitosis is the cell in and what is the haploid chromosome number in this species?

	haploid chromosome number	stage of mitosis
<b>A</b>	5	anaphase
<b>B</b>	5	metaphase
<b>C</b>	10	anaphase
<b>D</b>	10	metaphase

**[1 mark]**

### Question 5

The diagram shows a plant cell's chromosomes during metaphase.



Which row correctly describes this plant cell during metaphase?

	diploid number (2n) for the plant	structures present at metaphase		
		cell wall	centriole	spindle
<b>A</b>	4	✓	✗	✓
<b>B</b>	8	✗	✓	✓
<b>C</b>	8	✓	✗	✓
<b>D</b>	16	✓	✓	✗

[1 mark]

CHEMISTRY ONLINE  
— TUITION —

### Question 6

What row correctly describes an animal cell's nuclear envelope, centrioles and spindle during mitosis?

	phase	nuclear envelope	centrioles	spindle
A	anaphase	absent	replicate	present
B	metaphase	reforms	present	present
C	prophase	breaks up	move apart	forms
D	telophase	breaks up	replicate	breaks up

[1 mark]

### Question 7

Colchicine is a drug that is used to treat inflammation and pain. Its action within cells is to stop chromatids from separating during mitosis.

Which phase will the cell reach and then stop dividing?

- A anaphase
- B metaphase
- C prophase
- D telophase

[1 mark]

### Question 8

Which is the correct statement concerning cell and nuclear division?

- A** Mutagens can cause mutations whereas carcinogens can cause cancer. This means that all mutagens are carcinogenic.
- B** Just before prophase, the mass of DNA is double the normal mass. Following anaphase, this mass is reduced by half and following cytokinesis this mass halves again.
- C** Haploid eukaryotes can reproduce by mitosis whereas diploid eukaryotes can reproduce by mitosis or meiosis.
- D** Some of the roles of mitosis are growth, asexual reproduction, cell repair following tissue damage and cell replacement.

[1 mark]

### Question 9

Which statement about stages in mitosis correct?

- A** in metaphase the nuclear envelope breaks down
- B** in telophase chromatids separate
- C** in anaphase centrosomes divide
- D** in prophase centrioles separate

[1 mark]

**Question 10**

What of the following does not happen in an animal cell cycle?

- 1 DNA is expressed
- 2 spindle is formed from microtubules
- 3 cell plate forms to divide daughter cells

**A** 3 only      **B** 1 and 3 only      **C** 2 only      **D** none

**[1 mark]**

