

# 1.4 Cells: Division

## Question Paper

Course	DP IB Biology
Section	1. Cell Biology
Topic	1.4 Cells: Division
Difficulty	Easy

**Time allowed:** 60  
**Score:** /44  
**Percentage:** /100

### Question 1a

a)  
State which structure is formed in animal cells by the pinching of the plasma membrane during cytokinesis.

[1 mark]

[1 mark]

### Question 1b

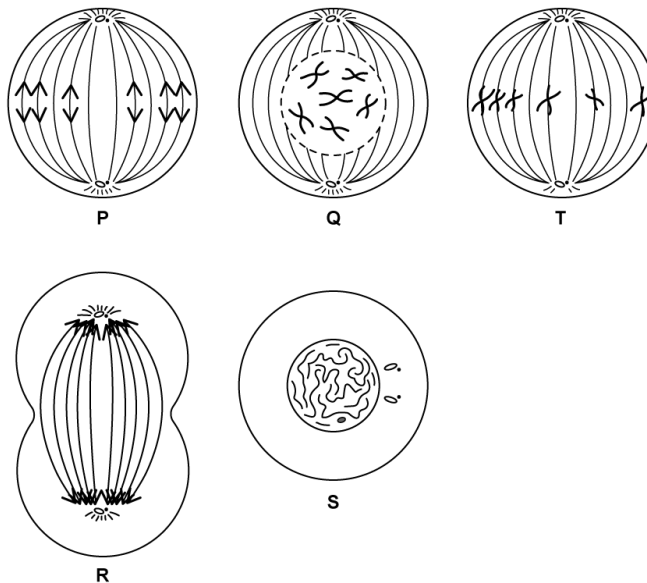
b)  
Define mitosis.

[2 marks]

[2 marks]

### Question 1c

c)  
The drawings below show a cell during different stages of mitosis.



List the stages P, Q, R, S and T in the correct sequence.

[3 marks]

[3 marks]

### Question 1d

d)

Cell **M** contains 74 chromosomes. It divides by mitosis.

State how many chromosomes the daughter cells will contain.

[1 mark]

[1 mark]

### Question 2a

a)

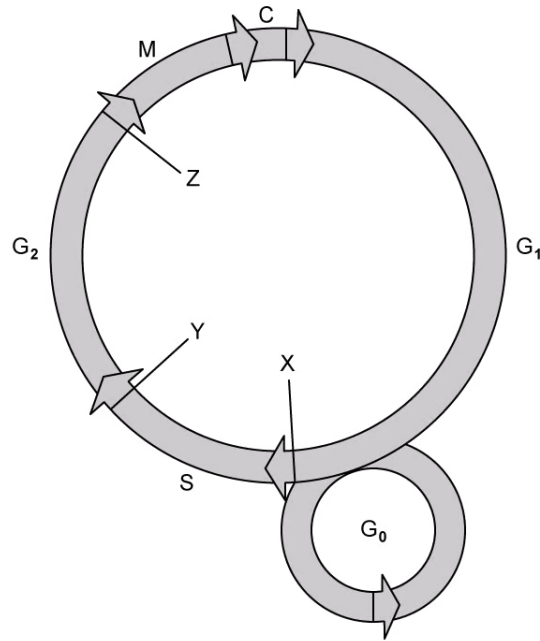
State which proteins are used to control the cell cycle.

[1 mark]

[1 mark]

**Question 2b**

b)  
The diagram below represents the different phases of the cell cycle.



State **all** the letters in the diagram that represent the phases of interphase.

[1 mark]

[1 mark]

**Question 2c**

c)  
The tumour suppressor gene TP53 codes for a protein that interrupts the cell cycle if there is any damage to the DNA and prevents the copying of damaged DNA.

State which stage of the cell cycle this gene would interrupt.

[1 mark]

[1 mark]

### Question 2d

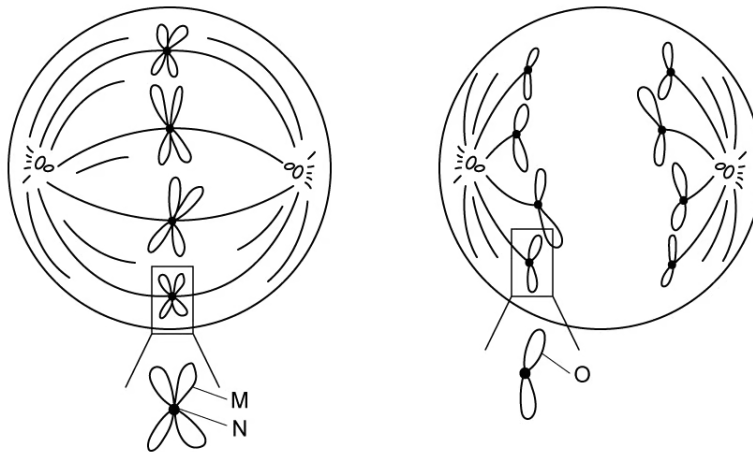
d)  
Define oncogene.

[2 marks]

[2 marks]

### Question 3a

a)  
The diagram below shows two different stages of mitosis.



Identify structures **M**, **N** and **O**.

[3 marks]

[3 marks]

### Question 3b

b)

List three reasons why cells will undergo mitosis.

[3 marks]

[3 marks]

### Question 3c

c)

State the process that occurs during prophase that enables chromosomes to condense.

[1 mark]

[1 mark]

### Question 3d

d)

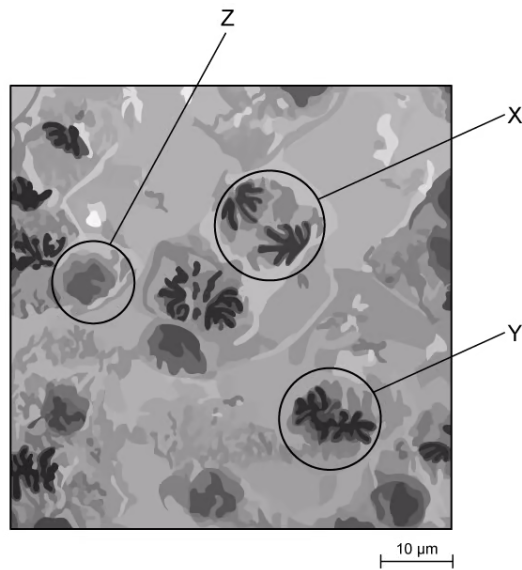
List **four** examples of mutagens.

[2 marks]

[2 marks]

### Question 4a

a)  
The diagram below shows some grasshopper cells.



State the stages of the cell cycle shown by X and Y.

[2 marks]

[2 marks]

### Question 4b

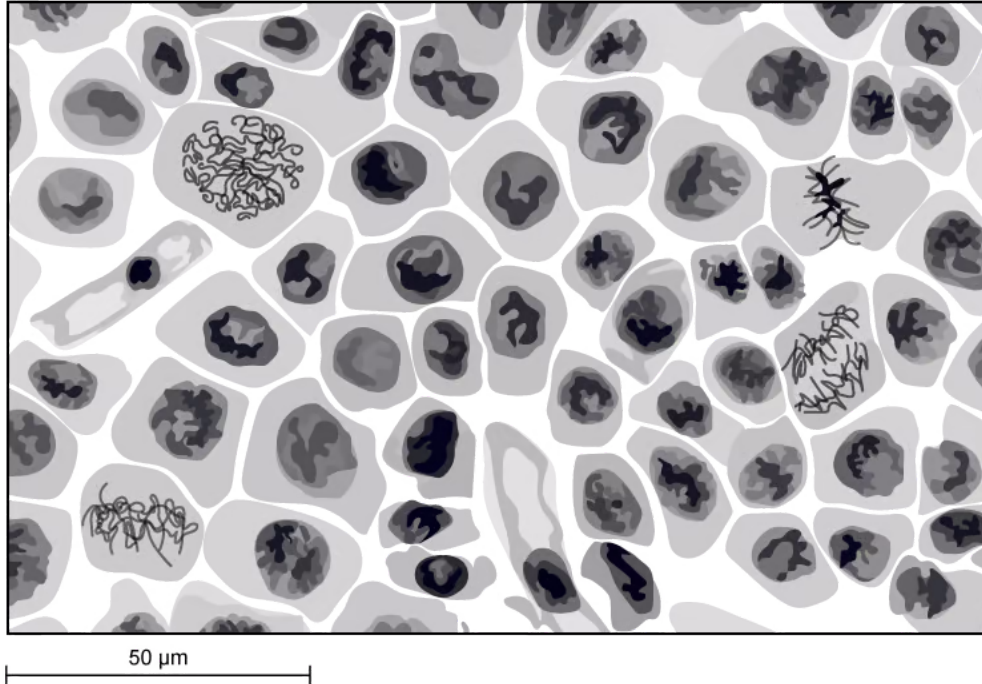
b)  
Outline the events occurring during the stage shown as Z in part (a).

[3 marks]

[3 marks]

### Question 4c

c)  
The diagram below shows onion cells from the root tip.



Calculate the mitotic index for this root tip.

[2 marks]

[2 marks]

### Question 4d

d)  
Doctors use the mitotic index when examining tumours.  
Suggest what a high mitotic index would indicate to a doctor.

[1 mark]

[1 mark]



### Question 5a

*One mark is available for clarity of communication throughout this question.*

a)

Outline how the role of cyclins in the cell cycle was discovered.

**[3 marks]**

**[3 marks]**

### Question 5b

b)

Budding yeast cells complete a cell cycle in 90 minutes.

Outline the stages in the cell cycle that result in the development of new yeast cells.

**[6 marks]**

**[6 marks]**

**Question 5c**

c)

Compare and contrast cell division of prokaryotic and eukaryotic cells.

**[6 marks]****[6 marks]**