

1. A chick can develop inside an egg.

As a chick develops, it makes new cells.

These are the stages of the cell cycle. They are **not** in the correct order.

- A** Movement of the chromosomes
- B** Cell division
- C** Cell growth
- D** DNA replication
- E** More cell growth

Write the letters in the boxes to show the correct order of the stages in one cell cycle.
Two have been done for you.

C		E		
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[2]

2.

- i. Stem cells are found in human embryos.

Describe what happens to stem cells as the embryo develops into a baby.

[2]

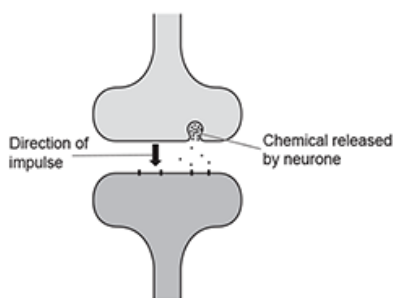
- ii. It takes one cell 12 hours to divide to produce two cells.

Starting with one cell, calculate how many cells there will be after 2 days.

Number of cells = [3]

3. Synapses are junctions between neurones.

For an impulse to be generated in another neurone, a chemical must be released into the gap.



Which word describes how the chemical moves across the gap?

- A** Diffusion
- B** Osmosis
- C** Respiration
- D** Transpiration

Your answer

[1]

4. What is the percentage change in mass of the potato chip during an experiment?

Mass of potato chip before (g)	Mass of potato chip after (g)
5.7	5.2

- A** – 0.5 %
- B** – 8.8 %
- C** – 9.6 %
- D** – 91.2 %

Your answer

[1]

5. Heart disease causes damage as muscle cells can be replaced with scar tissue.

This makes the heart less efficient at pumping blood, which affects all the cells of the body. Doctors can treat heart disease by injecting the heart muscle with stem cells.

Explain how this could improve the lives of people with heart disease.

[3]

6. A condition called dry eye can be caused by damage to the corneal cells in the eye.

- Dry eye can now be treated using stem cells.
- The stem cells are taken from the patient's own tissues and not from a donor.

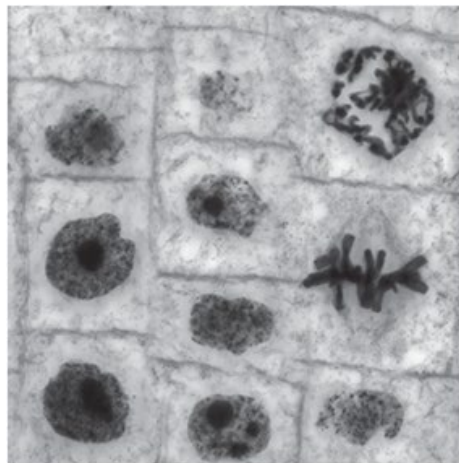
Suggest why the stem cells used in this treatment are taken from the patient's own tissues.

[1]

7(a). A student observes the stages of cell division in cells taken from the root tips of garlic.

They cut a small amount of root tip and squash it onto a microscope slide.

The image shows some of the cells observed by the student.



- i. Identify one cell in the image that shows the chromosomes starting to move apart.

Draw an arrow to this cell on the image. Label the arrow **A**.

[1]

- ii. Draw a second arrow to identify one nucleus in the image. Label this arrow **N**.

[1]

- (b). Give **one** reason why the tissue for the sample was taken from root tips.

[1]

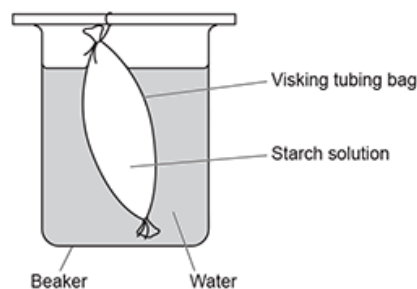
8. When one cell divides by mitosis, how many new cells are produced?

- A** 1
B 2
C 4
D 8

Your answer ☐

[1]

9. Visking tubing is made of a selectively permeable membrane.
A visking tubing bag containing starch solution is placed in a beaker of water.



What will happen?

- A** Nothing will happen.
B Starch will leave the visking tubing bag.
C Water will enter the visking tubing bag.
D Water will leave the visking tubing bag.

Your answer ☐

[1]

END OF QUESTION PAPER