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AQA GCSE Biology · Topic 4.1 Cell biology

Cell division: practice questions

7 questions · 18 marks · mark scheme at the back

For AQA GCSE Biology 8461 and Combined Science: Trilogy 8464. **Triple only** is not in Combined Science. **Higher tier** is only on the Higher paper.

Name ..... Total ..... / 18

1 Which statement about chromosomes is correct? **[1 mark]**

A. ☐ They are small rings of DNA found in bacteria

B. ☐ They are found in the nucleus, are made of DNA and carry many genes

C. ☐ They are the part of the cell where respiration takes place

D. ☐ They are made of protein and carry one gene each

2 Describe what happens during the cell cycle in a body cell, up to the formation of two daughter cells. **[3 marks]**

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3 A scientist looks at the tip of a growing root. Many of the cells are dividing. Name the type of cell division taking place and explain why it is important in a plant. **[2 marks]**

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4 Describe the function of stem cells in (a) human embryos, (b) adult bone marrow, (c) plant meristems. **[3 marks]**

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5 Why are stem cells produced by therapeutic cloning less likely to be rejected by the patient's body? **[1 mark]**

A. ☐ The embryo is produced from bone marrow

B. ☐ The embryo has the same genes as the patient

C. ☐ The cells have been killed by treatment

D. ☐ The embryo contains no DNA

6 Give two ways in which stem cells from meristems can be used. **[2 marks]**

7 Stem cells from human embryos may one day be used to treat conditions such as diabetes and paralysis. Evaluate the use of stem cells in medical treatments. **[6 marks]**

Mark scheme

One mark for each point unless a maximum is given. Words in brackets are not needed for the mark.

1. [1]

B B (1)

2. [3]

- the cell grows / increases the number of sub-cellular structures (such as ribosomes and mitochondria) (1)
- DNA replicates to form two copies of each chromosome (1)
- in mitosis, one set of chromosomes is pulled to each end of the cell and the nucleus divides (1)
- the cytoplasm and cell membranes divide to form two identical cells (1)
- Max 3.

3. [2]

- mitosis (1)
- for growth (of the plant) / development / production of new cells (1)

4. [3]

- (a) can differentiate into most types of human cell (1)
- (b) can form many types of cell, including blood cells (1)
- (c) can differentiate into any type of plant cell, throughout the life of the plant (1)

5. [1]

B B (1)

6. [2]

- to clone rare species to protect them from extinction (1)
- to produce clones of crop plants with special features (such as disease resistance) quickly and economically / in large numbers for farmers (1)

7. [6]

Level 3 5-6	A balanced evaluation that considers benefits, risks and ethical or religious objections in detail, with a justified conclusion. Scientific terms are used accurately.
Level 2 3-4	Some benefits and some risks or objections are described, but the evaluation is not fully balanced or there is no clear conclusion.
Level 1 1-2	Simple points are made on either benefits or risks only, with little or no development.

Indicative content

- stem cells can differentiate into many types of cell, so can replace damaged or lost tissue
- may help conditions such as diabetes and paralysis
- in therapeutic cloning, the embryo has the same genes as the patient, so the cells are not rejected
- risk of transfer of viral infection
- some people have ethical or religious objections to using embryos
- conclusion that weighs benefit to patients against risks and objections