1.7 Chromosomes, DNA and Mitosis: Test Pack

Total Marks

EDEXCEL 4BI1 · Calculator allowed · about 15 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Define the term 'chromosome' as used in the context of cells and inheritance. Name the subcellular location where chromosomes are found in most human cells.

(Total for Question 1 is 1 mark)

2 State what is meant by the term 'diploid' and give the diploid chromosome number for a normal human somatic cell.

(Total for Question 2 is 2 marks)

3 A sample contains 18 cells. Four are observed with chromosomes being pulled towards opposite poles. State how many cells are not in this observed stage.

(Total for Question 3 is 1 mark)

4 A human skin cell before mitosis contains 46 chromosomes. After mitosis and cytokinesis are complete, how many chromosomes will each daughter cell have, and will they be genetically identical to the original cell? Explain briefly.

(Total for Question 4 is 3 marks)

© Revision Library | revisionlibrary.co.uk

5 Describe the components of a nucleotide, the repeating unit of DNA, as used in 4BI1 specification diagrams. Name the four bases used in DNA.

(Total for Question 5 is 2 marks)

6 A student observes a dividing animal cell. The chromosomes are no longer at the equator and two groups are moving towards opposite ends of the cell. Name the stage, describe what has separated and state what observation supports the stage identification.

(Total for Question 6 is 3 marks)

© Revision Library | revisionlibrary.co.uk

Mark scheme · 1.7 Chromosomes, DNA and Mitosis: Test Pack

Question 1

a structure made of DNA and protein that carries genes, found in the nucleus of cells — **B1**

Answer: A structure of DNA and protein that carries genes; found in the nucleus

Question 2

diploid means having two sets of chromosomes, one from each parent — **B1**

46 chromosomes in a normal human somatic (body) cell — **B1**

Answer: Diploid means two sets of chromosomes; humans have 46 chromosomes in somatic cells

Question 3

14 cells — **B1**

Answer: 14 cells

Question 4

each daughter cell will have 46 chromosomes — **B1**

states they will be genetically identical to the original cell — **B1**

brief reason: mitosis replicates the chromosomes and then separates sister chromatids so each daughter gets a full set — **B1**

Answer: Each daughter cell will have 46 chromosomes and will be genetically identical to the original cell, because mitosis copies the chromosomes and separates sister chromatids so each daughter receives the same full set.

Question 5

a nucleotide contains a sugar (deoxyribose) and a phosphate group — **B1**

and a nitrogenous base attached to the sugar (adenine, thymine, cytosine or guanine) — **B1**

Answer: Each nucleotide has a sugar (deoxyribose), a phosphate group and a nitrogenous base: adenine, thymine, cytosine or guanine

Question 6

anaphase — **B1**

sister chromatids have separated — **B1**

two chromosome groups are moving towards opposite poles — **B1**

Answer: Anaphase; sister chromatids have separated and the two groups move towards opposite poles

© Revision Library | revisionlibrary.co.uk