1.8 Meiosis and the Causes of Variation: 10-minute Pack

Total Marks

EDEXCEL 4BI1 · Calculator allowed · about 10 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 State briefly why gametes produced by meiosis are genetically different from each other, in the context of producing variation within a species.

(Total for Question 1 is 1 mark)

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2 In a species with 36 chromosomes in each body cell, state the number of chromosomes in a normal gamete produced by meiosis.

(Total for Question 2 is 1 mark)

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3 Two genetically similar young plants grow in different light levels. Name one environmental factor in this example that could cause variation in their growth.

(Total for Question 3 is 1 mark)

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4 Give one example of a variation caused mainly by genetics and one caused mainly by the environment, naming the organism or human trait in each example.

(Total for Question 4 is 2 marks)

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5 In a population survey for blood groups, 18 out of 60 people sampled had blood group O. Calculate the percentage of people with blood group O to one decimal place.

(Total for Question 5 is 3 marks)

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6 In a group of seedlings, plants with the same inherited variety have different heights after growing in different soil moisture. Give one genetic cause and one environmental cause that could contribute to variation in plant height.

(Total for Question 6 is 2 marks)

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Mark scheme · 1.8 Meiosis and the Causes of Variation: 10-minute Pack

Question 1

because meiosis produces different combinations of genes in each gamete (leading to genetic differences) **B1**

Answer: Because meiosis produces gametes with different combinations of genes so each gamete is genetically different

Question 2

18 chromosomes **B1**

Answer: 18 chromosomes

Question 3

Light level (or amount of light received) **B1**

Answer: Light level.

Question 4

one genetic example, e.g. blood group in humans or flower colour determined by genes **B1**

one environmental example, e.g. plant height affected by nutrient availability or tan in humans caused by sun exposure **B1**

Answer: Genetic example: human blood group. Environmental example: plant height affected by nutrient availability

Question 5

forms the fraction 18/60 and multiplies by 100 **M1**

percentage = 30.0% cao **A1**

gives answer to one decimal place as 30.0% or equivalent **B1**

Answer: 30.0%

Question 6

A genetic cause, such as inherited alleles or a mutation **B1**

An environmental cause, such as soil moisture or light **B1**

Answer: Inherited alleles can cause genetic differences; soil moisture can cause environmental differences.

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