

Selective breeding and tissue culture: practice questions

6 questions · 15 marks · mark scheme at the back

For Edexcel GCSE Biology 1BI0 and Combined Science 1SC0. **Triple only** is not in Combined Science. **Higher tier** is only on the Higher paper.

Name

Total / 15

1 Which is a possible disadvantage of selective breeding? [1 mark]

- A. ☐ It increases genetic variation.
- B. ☐ It reduces genetic variation.
- C. ☐ It only takes one generation.
- D. ☐ It involves inserting genes from other species.

2 Describe how a farmer could use selective breeding to produce cattle that give more milk. [4 marks]

3 In a plant, resistance to a disease is controlled by a dominant allele R. Susceptibility is controlled by the recessive allele r. Two plants with the genotype Rr are crossed. Use a genetic diagram to find the probability that an offspring is susceptible. [3 marks]

Answer =

4

Triple only

[3 marks]

Describe how tissue culture can be used to produce new plants.

5

Triple only

[2 marks]

Give two advantages of using tissue culture in plant breeding programmes.

6

Triple only

[2 marks]

Explain how tissue culture is useful in medical research.

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. [4]

- select a bull and cows that produce a lot of milk / with high milk yield (1)
- breed them together (1)
- select offspring that produce the most milk and breed them (1)
- repeat over many generations (1)

3. [3]

- gametes R and r from each parent (1)
- offspring RR, Rr, Rr, rr (1)
- probability of rr = $1/4$ or 25% (1)

4. [3] Triple only

- take small pieces of tissue / cells from the parent plant (1)
- use aseptic technique / sterile conditions to prevent contamination (1)
- grow on a nutrient medium (agar) with nutrients and growth hormones (1)
- cells divide to form new plants that are identical to the parent (1)
- Max 3

5. [2] Triple only

- many identical plants produced quickly (1)
- from a small amount of tissue (1)
- desirable characteristics are kept / plants are genetically identical (1)
- can be done all year / in a small space (1)
- rare / endangered plants can be reproduced (1)
- Max 2

6. [2] Triple only

- large numbers of identical cells can be grown (1)
- so new drugs can be tested on them / disease can be studied, with reliable results (1)