

Variation: practice questions

7 questions • 19 marks • mark scheme at the back

For Cambridge IGCSE Biology 0610 (and 0970, which has the same content). **Supplement** is Extended content, only examined on Papers 2 and 4.

Name

Total / 19

1 Which feature shows discontinuous variation? [1 mark]

- A. ☐ Body mass
- B. ☐ ABO blood group
- C. ☐ Body length
- D. ☐ Leaf length

2 (a) Describe what is meant by variation. [1] (b) State what is meant by continuous variation. [3 marks]
[1] (c) Give one example of continuous variation in humans. [1]

3 Body mass shows continuous variation. ABO blood group shows discontinuous variation. [3 marks]
Explain the difference in the causes of these two types of variation.

- 4** A student measured the length of 40 leaves from one tree and recorded the results in the table. [4 marks]
(a) State the type of variation shown. [1] (b) State the modal class. [1] (c) Explain how the data support your answer to (a). [2]

Leaf length of 40 leaves	
leaf length / mm	number of leaves
20-24	3
25-29	8
30-34	16
35-39	9
40-44	4

- 5** (a) Define the term mutation. [1] (b) State what mutations produce in a population. [1] (c) Name one factor that increases the rate of mutation. [1] **[3 marks]**

- 6** **Supplement** **[4 marks]**

(a) Describe gene mutation. [2] (b) State two other sources of genetic variation in a population. [2]

7**Supplement****[1 mark]**

Which statement about gene mutation is correct?

- A. ☐ It is a planned change to a gene
- B. ☐ It is a random change in the base sequence of DNA
- C. ☐ It only occurs in gametes
- D. ☐ It always produces harmful features

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]

- (a) differences between individuals of the same species (1)
- (b) results in a range of phenotypes between two extremes (1)
- (c) body length / body mass (1) allow height; reject blood group

3. [3]

- blood group / discontinuous variation is caused by genes only (1)
- body mass / continuous variation is caused by genes and the environment (1)
- environmental factor named for body mass, e.g. diet / amount of exercise (1)

4. [4]

- (a) continuous (variation) (1)
- (b) 30–34 mm (1)
- (c) a range of lengths between two extremes / from 20 mm to 44 mm (1)
- many intermediate lengths / no separate categories / length can take any value (1)
- most leaves in the middle classes and fewest at the extremes (1)
- Max 2 for (c)

5. [3]

- (a) genetic change (1)
- (b) new alleles (1)
- (c) ionising radiation / X-rays / gamma rays / (some) chemicals, e.g. chemicals in tobacco smoke (1)
reject heat

6. [4] **Supplement**

- (a) random (change) (1)
- change in the base sequence of DNA (1)
- (b) any two from: meiosis (1)
- random mating (1)
- random fertilisation (1)
- reject mutation in (b); ignore environment
- Max 4

7. [1] **Supplement**

B B (1)