

# MARK SCHEME

# GCSE

## BIOLOGY

## AQA - COMBINED SCIENCE

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B 6 - TEST 2

INHERITANCE, VARIATION AND EVOLUTION

Beginner

## Mark schemes

- 1.** (a) toxins 1
- (b) (i) bacteria 1
- (ii) mutate 1
- (iii) new / different antibiotic  
*allow new / different drug*  
*do **not** allow vaccine* 1
- [4]
- 2.** extinct (NOT fossils)  
fossils  
bones  
rocks
- each for 1 mark*
- [4]
- 3.** (a) (i) 3 billion years ago 1
- (ii) any **one** from:
- the theory challenged religious beliefs
  - there was insufficient evidence at the time  
*allow no evidence / proof*
  - mechanism of inheritance / variation not known  
*accept genes not known about*
  - people believed in different theories.
- 1
- (b) (i) 2 (million years ago) 1
- (ii) Snow leopard  
*do **not** allow leopard* 1
- (c) camouflaged  
*allow description of camouflage,*  
*eg blends in with background*  
*allow less likely to be seen* 1
- [5]

- 4.** (a) (i) testis 1  
ovary 1
- (b) fertilisation **or** fertilise(d) / (ing)  
*accept fusion*  
*do not credit conception **or** intercourse* 1
- (c) (i) the same, identical  
*do not credit very similar make clear*  
*their genetic material is the same*  
*do not credit the same number of chromosomes or genes* 1
- (ii) the same, identical  
*make clear their genetic material is the same*  
*do not credit the same number of chromosomes or genes* 1

[5]

- 5.** (a) (i) any **one** from  
mutations  
discontinuous variation 1
- (ii) gene  
*accept any clear indication such as a tick* 1
- (b) any **one** from  
gamma radiation  
*accept radiation*  
X-rays  
ultra violet rays  
chemicals  
*accept mutagens*  
chance 1

(c) zebras breed (to produce)

1

fertile offspring

*do not accept mating*

1

[5]

**6.** in the correct order

DNA

1

23

1

XX

1

XY

1

recessive

1

dominant

1

[6]

**7.** (a) 3 billion

1

(b) mutation

1

selection

1

evolution

1

(c) (i) crocodile

1

80 (million years ago)

*do not accept 80 years*

1

[6]

**8.** (a) (i) 1

1

fertilisation / fusion  
allow sexual reproduction  
allow fertilise / fuse  
ignore joining

- (b) (i) **Dd** 1  
(ii) **dd** 1  
(c) (i) 1 in 2 1  
(ii) 0 1

**[6]**

**9.**

(a) DNA  
allow deoxyribonucleic acid  
allow lower case letters

- (b) gametes 1  
(c) meiosis 1  
(d) 20 1  
(e) dominant 1  
(f) Bb  
or  
bB 1  
(g) bb circled  
allow ecf from part (f) 1  
(h) 1 in 4 / 25% / 1:3 / 0.25 /  $\frac{1}{4}$   
allow ecf from part (f)  
do **not** accept 1:4 1

**[8]**

**10.**

(a) a double helix  
a polymer

1

1

- (b) gene 1
- genome 1
- in this order only*
- (c) sperm **and** egg(s) / ova / ovum 1
- in either order*
- (d) fertilisation 1
- (e) the cell divides twice 1
- the new cells have half the number of chromosomes 1
- [8]**
- 11.** (a) *Triticum spelta* 1
- (b) (pig) 2  
**and**  
(wheat) 4  
*both needed for 1 mark* 1
- (c) pig  
*allow ecf from part (b)* 1
- (d) only a small sample (of DNA)  
*ignore references to structure and appearance* 1
- (e) any **three** from:  
  - (farmer) selects heaviest / largest chickens / parents  
*allow (farmer) selects chickens with the best / most meat*
  - (cross) breeds these chickens together
  - (farmer) selects the heaviest / largest offspring (to breed)
  - repeats this many times (until you have the desired chicken)
3
- (f) high(er) income / profit 1
- (g) the chickens may weigh too much to be able to stand 1
- [9]**

12.

(a) **only genetic causes**

any **one** from:

- pattern of scales
- number of fins
- eye colour

1

**only environmental causes:**

- scar

1

**both genetic and environmental causes:**

- length

1

(b)

	<b>B</b>	<b>b</b>
<b>b</b>		bb
<b>b</b>	Bb	bb

*allow 2 correct for 1 mark*

2

(c) any bb circled

1

(d) 0.5

*allow ecf from 04.2*

1

(e)  $(260\,000 / 2 =) 130\,000$

*allow ecf from 04.4*

1

(f) mutation

*allow change in diet / hormones / DNA*

1

[9]