

## Mark schemes

1

(a) any **two** from:

- most people still believed that God made all the animals / plants on Earth  
*allow against their 'religion'*
- insufficient evidence  
*do not allow no proof / evidence*  
*ignore 'fossil'*
- the mechanism of inheritance / genes unknown (at the time)

2

(b) any **four** from:

- finches separated / isolated
- genetic variation / mutation (in finch population(s))
- finches with alleles / genes best suited to their environment survive  
*Do not allow 'characteristics'*
- advantageous alleles / genes passed on (to offspring)
- after many generations / a long time, the populations can no longer successfully interbreed  
*Ignore 'speciation'*

4

(c) (i) vegetarian finch

1

(ii) **R**

1

(iii) mangrove **and** woodpecker finches

1

[9]

2

(a) in 1978  
fewer finches **or** population smaller

1

any **two** from:

- no beaks less than 8mm
- no beaks greater than 11.5 / 12mm  
*if these points not given allow smaller range of beak sizes for 1 mark*
- mean / average beak size higher

2

(b) variation or range or mutation of beak sizes

*do not accept idea that drought / seed size caused mutation*

1

birds with larg(er) beaks are better adapted for feeding  
*accept idea of competition for food / seeds amongst finches*

1

birds with larg(er) beaks survive  
*accept (only / more) birds with large beaks were better competitors*

1

birds with larg(er) beaks breed **or** gene / allele for large beak passed on  
*do **not** accept large beak passed on*

1

[7]

3

(a) (soft) body parts / other parts / named parts  
*accept flesh*

1

decayed / decomposed / rotted / eaten

**or**

bones do not decay / decompose / rot / get eaten  
*ignore disintegrated / dissolved*  
*ignore microorganisms*

1

(b) any **one** aquatic feature from: eg

- streamlined body shape
- long tail
- eyes on top of head
- scales
- fins / paddles / flippers / webbed feet  
*ignore gills*

1

any **one** terrestrial feature from:

- (front) legs / limbs / hands
- could lift front end upwards

*ignore feet*

*accept for 2 marks eg fin / flipper can be used for walking*

*or fins like legs*

1

[4]

4

(a) mutation

*correct spelling only*

*ignore other adjectives eg random / spontaneous*

1

(b) *ignore references to X / Y chromosomes*

idea of mutant gene / new form / this allows hatching (of males)

1

(individual with advantage) (more) survive / (more) live / (more) don't die

*allow immunity rather than resistance throughout*

1

(so survivors) breed / reproduce

1

mutation / gene passed (from survivors) to offspring / next generation

*allow resistance / characteristic for gene*

*'gene passed on' is insufficient*

1

[5]

5

(a) lemur(s)

1

(b) gorilla(s)

*in either order*

1

chimpanzee(s)

*accept chimps*

1

- (c) (i) (Charles) Darwin  
*accept (Alfred) Wallace*  
*if first name given it must be correct* 1
- (ii) variation  
*in this order* 1
- environment  
*allow phonetic spellings* 1
- survive 1
- generation 1

[8]

- 6** (a) organisms that can breed together  
*accept converse points re. 2 different species* 1
- successfully  
*accept produces fertile offspring* 1

- (b) any **two** from:  
 (live at)
- different pH of soil
  - different height above sea level
  - different flowering times
- 2

**AND**

genetic variation / mutation / different alleles (produced in isolated populations) 1

natural selection acts differently on the two populations

**or** different characteristics in the two populations survive

**or** different alleles passed on in the two groups 1

eventually resulting in interbreeding no longer possible 1

[7]

7

any **two** from:

- religious objections
- insufficient evidence  
*allow 'could not prove'*  
*ignore 'no evidence'*
- mechanism of heredity not known

[2]

8

(a) (Jean Baptiste) Lamarck  
*allow phonetic spelling*

1

(b) (snake is) covered in sediment / mud  
**or**  
sinks into the mud

1

(then) the soft parts decay / are eaten  
**or**  
bones / hard parts do not decay

1

(so) minerals enter bones  
**or**  
bones are replaced by minerals

1

(c) **Level 3 (3–4 marks):**

A detailed and coherent explanation is provided. Logical links between clearly identified, relevant points explain how the rat snake evolved through the process of natural selection.

**Level 2 (1–2 marks):**

Simple statements made, but not precisely. The logic is unclear.

**0 marks:**

No relevant content.

**Indicative content**

**statements:**

- there are lots of different colours of snakes
- some shades of green are closer to the colour of the environment (in Japan) than others
- survivors (in each generation) will breed and produce offspring

**explanations:**

- different colours are controlled by different genes / alleles / are caused by mutations
- being green means they are best suited to grassy / green environments
- being green means they are camouflaged
- those that are camouflaged best will be able to catch more food
- those that are camouflaged best will be able to avoid being eaten
- survivors' offspring will inherit the genes / alleles / mutation for the shade of green colouration

**additional examiner guidance:**

- allow converse points relating to the Texas rat snake if they clearly identify the reasons why this snake was at an evolutionary disadvantage, ie more likely to be caught and eaten by a predator
- a good level 2 answer will clearly link survival and breeding to the passing on of the advantageous genes / alleles / mutations and link the idea of colour (AO2) to a correct explanation of its significance for survival

4

(d) any **one** from:

- changes to the environment
- new predators
- new diseases
- new (more successful) competitors
- catastrophic event / described event

1

[9]

9

(a) (i) natural

1

(ii) simple

1

(iii) three billion

1

(b) any **two** from:

- reference to religion
- insufficient evidence / couldn't prove it / no proof  
*ignore no evidence*
- mechanism of inheritance / variation not known  
*allow genes / DNA not known about*
- reference to other theories
- reference to Darwin's status

2

(c) (i) tree

1

- (ii) hippopotamus **and** pig  
*both required, either order*  
*allow hippo*

1

(iii) new evidence from fossils

1

[8]

10

(a) selection

1

(b) (i) 4

1

(ii) ground finch / lives on the ground

1

(only) eats seeds

*allow eg eats seeds on / from the ground for 2 marks*

1

(c) Lamarck

1

[5]

11

(a) (i) reduced photosynthesis

*ignore growth*

*do **not** allow need light for respiration*

1

(ii) less food (for animals) **or** less oxygen (for animals)

*allow loss of habitat*

1





12

- (a) any **two** from:
  - larger / longer / thicker  
*allow examples eg fewer toes or bones fused*
  - fewer (bones in total)  
*allow smaller surface area touching the ground*
  - fewer bones touching the ground

2

(b) (i) large(r) surface / area in contact with the ground

**or**

low / less pressure on ground

1

(so) less likely to sink into mud / ground

**or**

(so) could run fast(er)

*allow easy / easier to escape predators*

1

(ii) variation (in size / number / arrangement of bones)

*allow mutation(s) (in size / number / arrangement of bones)*

1

(and) those with large(r) / few(er) bones more suited to running **or** run faster (on harder / drier ground)

1

these survive **and** breed

*allow ref to offspring for breed*

1

(so) genes / DNA (for larger / fewer bones) passed on

*allow alleles passed on*

1

**[8]**

13

(a) three billion

1

(b) mutation(s)

1

breed / reproduce

*in this order only*

*allow pass on their genes*

1

**[3]**