

B2.5 Variation and Natural Selection ~ HW booklet answers

1. (a) (i) Plots correct; bars B [4]  
 Scaling of y-axis correct;  
 Label of y-axis;
- (ii) 160-164.9 [1]
- (iii) Genes; [2]  
 Environment;
- (b) (i) 40%; [1]
- (ii)  $\frac{40}{100} \times 20$ ; 8; (or 8 on own for [2]) [2]
- (c) Discontinuous; [1]
- 11

2. (a) Punnett; 

	R	R
R	RR	RR
r	Rr	Rr

D [4]
- RR for parent;  
 parent Rr;  
 correct offspring;
- (b) (i) 3:1 E [1]
- (ii) discontinuous [1]
- (iii) blood groups/tongue rolling/attached ear lobes/eye colour/gender [1]
- 7

3. (a) (i) **Genetically** identical; F [1]
- (ii) They may have been grown in different (environmental) factors/  
 described [1]
- (iii) Mitosis; [1]
- (b) (i) **Genetic** variation/different genes or alleles or mixture of genotypes; [1]
- (ii) Continuous; G [1]
- 5

4. (a) Any **two** from 



  
 Section of/a short length;  
 of a chromosome/DNA;  
 codes for a protein;  
 inherited/from your parents like eye colour; [2]
- (b) Length of nails; [1]
- (c) Height; [1]
- (d) Continuous; [1]
- 5

5. (a) (i) 4 – 20

[1]

(ii)  $12 + 10 + 8 + 6 + 4 + 3; = 43$

[2]

(iii) **more** aware/**more** touch receptors/**more** sensitive;  
example: navigation/helps find shelter/find mates/avoid danger/  
avoid injury/escape predators/find food;

[2]

(b) (i) RR; Rr

[2]

(ii) punnett;  
R and R (as gametes) or R;  
r and r (as gametes) or r;  
correct cross

[4]

(iii) red eyes

[1]

AVAILABLE  
MARKS

12

6. (a) (i) transpiration

[1]

(ii) arrow from a cell to the air space (must start in a cell or edge of cell);  
through the **stoma** only (only with arrow going **out**);

[2]

(b) less surface area/no stomata;  
less water loss/less evaporation

[2]

(c) (i) 1pm–5pm/12.30–4.30/12–4

[1]

(ii) more stomata open, greater rate of water loss (or converse)

[1]

(iii) line starting at 8 squares up;  
increasing until midday (at least) and then starts to decrease at some  
stage;

[2]

(iv) saltwort **better adapted**/have advantageous gene  
saltwort plants (survive) to **reproduce**  
pass on **genes**/pass on allele/favourable characteristics  
allow **converse** answers

[3]

12

7.

Brown rabbits are better camouflaged/white rabbits are more easily seen;  
More brown rabbits survive/white rabbits are eaten;  
More brown rabbits reproduce/breed;  
Brown rabbits pass on their genes/alleles;

[4]

(b) Any **two** from:

- **More** snow/so that it is paler/return to grassland/paler crop
- Disease in foxes/decrease in rabbit predators/increase of predators of the fox
- Disease in **brown** rabbits

[2]

6

8.

Any **three** from:

- have advantageous characteristic/allele/beneficial to be a carrier/or described people who are carriers/don't get malaria if bitten;  
(**NOT** natural protection as advantageous mark – already in question)
- more sickle cell carriers survive
- to reproduce/reproductive age;
- pass on allele/gene/carrier gene/characteristic/trait

[3]