

# 18. Variation and selection

## 18.2 Adaptive features

### Paper 3 and 4

#### Marking Scheme

**Q1.**

(b)(i)	inherited ; survive ; reproduce / breed (described) ;	3	A MP2 and MP3 in either order
(b)(ii)	<i>any one from:</i> <i>idea of:</i> to catch prey (described) AW ; for defence / to fight other, scorpions / males / AW ; AVP ;	1	

**Q2.**

(d)	adaptive (feature) ;	1	
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**Q3.**

(a)	inherited / hereditary ; survive ; environment / habitat ;	3	
(b)(i)	4.4–4.5 ( $\mu\text{m}$ ) ;	1	
(b)(ii)	9 ;	1	
(b)(iii)	continuous / phenotypic ;	1	

**Q4.**

(c)	water / aquatic ;	1	
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## Q5.

(a)	an inherited (structural) feature ; that helps an organism to, survive / reproduce (in its environment) ;	2	
(b)(i)	<b>A</b> – palisade mesophyll ; <b>B</b> – spongy mesophyll ; <b>C</b> – <u>air</u> spaces ;	3	
(b)(ii)	<i>any three from:</i> many (air spaces) / large (air spaces) ; reduces density (of the leaf) ; allowing it to float / be on water / be near surface of water ; (so) accessible, to light / carbon dioxide / gas exchange / AW, for photosynthesis ;	3	
(c)(i)	<i>total of five from:</i>  <i>comparison - max three from:</i> 1 tomato has <u>more</u> stomata on its lower epidermis than its upper epidermis ; 2 water lily has, stomata <b>only</b> on upper epidermis / <b>no</b> stomata on lower epidermis ; 3 water lily has more stomata on upper epidermis than tomato ; ORA 4 water lily has more stomata (per mm <sup>2</sup> ) than tomato ; ORA 5 any use of comparative manipulated figures from table including unit (at least once in the answer) ;  <i>explanation:</i> 6 (tomato has most stomata on lower epidermis) so not facing the sun ; 7 <i>idea that</i> tomato needs to reduce, water loss / transpiration / evaporation ; 8 water lily (floats on water so) only upper surface is exposed to air ; 9 (water lily has large number of stomata) as water does not need to be conserved ;	5	
(c)(ii)	guard (cells) ;	1	

## Q6.

(a)	<i>fur colouring</i> camouflaged so that not seen by prey (when stalking) / reflecting heat / AW ;  <i>streamlined body shape</i> improved ability to run fast / reduced air resistance / AW / AVP ;	2
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## Q7.

(a)	(the probability that an organism will) survive <u>and</u> , reproduce / AW ;	1	
(b)(i)	(during the day they) remain in a burrow / stay in the shade / stay inactive / sleep / AW ; light colour / pale / yellow / white (fur / hair) / AW ; thin / long, tail / legs ; thin / short / little, fur ; no fur on legs ; fur on feet ; large, ears / pinna(e) ; little / no, fat ; large surface area: volume ratio ; produces, little / concentrated, urine ; AVP ;	2	<b>A</b> nocturnal (habit)  <b>A</b> ref. to long kidney tubules / AW
(b)(ii)	big eyes / large pupils / good eyesight ; whiskers ; lots of rods (in the retina / fovea) ; large ears / good sense of hearing / sensitive ears ; good sense of smell ;	2	<b>A</b> eye has no cones

## Q8.

(a)(i)	the probability of an organism will surviving <u>and</u> reproducing (in the environment in which it is found) / AW ;	1	
(a)(ii)	<i>aerial roots</i> for anchorage / stability (in flowing water) / (aerobic) respiration / gas exchange / oxygen absorption ;  <i>floating seeds</i> for (seed) dispersal (carried on water) / reduce competition (from parent) / access to oxygen (to germinate / respire) ;	2	