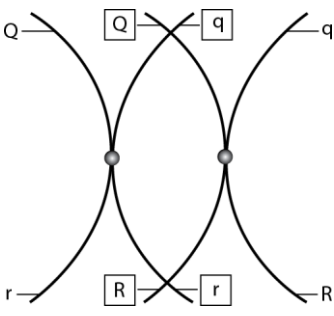
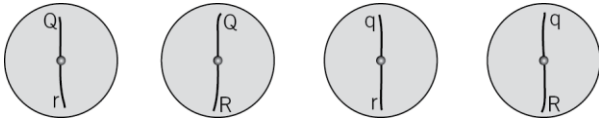


Question number	Answer	Marks	Guidance
1 a	Try-Gly-Lys-Val-Gly	2	2 marks if all correct 1 mark if 4 correct.
1 b	Substitution of G for C in second triplet (no mark) Amino acid changed from Gly to Ala; Alters the primary structure/ amino acid sequence of protein; Tertiary structure altered / bond positions altered; As structure altered function may be affected;	3	
2 a	diploid number is restored; at fertilisation;	2	
2 b i	E- chromatid; F – centromere;	2	
2 b ii	any correctly shaded pair;	1	
2 b iii	6	1	
2 b iv	8	1	2 <sup>3</sup> as there are 3 homologous pairs there are 8 different ways in which the maternal and paternal
2 c i	an alternative form of a gene;	1	
2 c ii	Q Q on both chromatids of left hand chromosome and q q on both chromatids of right hand chromosome; r R and r R where crossing over occurs; 	2	

Question number	Answer	Marks	Guidance
2 c iii	<p>each chromosome shown as single strand; Q and q alleles in correct place; R and r alleles in correct place;</p> 	3	<p>should have following arrangements on the chromosomes: Q and r, Q and R, q and r, q and R</p>
3 a i	<p>plant is selected at random; reduces / eliminates bias (in sampling);</p>	2	
3 a ii	<p>leaves likely to be similar age; newer leaves/nearer tip of shoot likely to be smaller OR older leaves/leaves further down likely to be larger;</p>	2	
3 b	<p>No (no mark) calculating <u>mean</u> length of each sample;</p>	1	
3 c	<p>depends where you measure - leaf has different widths along its length;</p>	1	
3 d i	<p><math>116 - 42 = 74</math> <math>113 - 41 = 72</math></p>	2	
3 d ii	<p>The range values would suggest that the leaves are similar in size; Mean values are different and green leaves have higher SD showing more variation in length than variegated leaves;</p>	2	
4 a	<p>mutation occurs; in gene which codes for the enzyme;</p>	2	Reject penicillin causes mutation.
4 b	<ol style="list-style-type: none"> <li>1. bacteria cell wall is weak;</li> <li>2. water moves into bacterial cell by osmosis;</li> <li>3. bacterial cell bursts (lyses);</li> </ol>	3	osmotic lysis gets mp 2 an3.
6 a	<p>Small surface area to volume ratio / more fat; Lose less heat (to the environment) / for insulation; they are sitting on eggs;</p>	2 max	
6 b i	<p>The further north/higher the latitude, the higher the percentage (of white snow geese);</p>	1	
6 b ii	<p>Snow lying longer/melts slower further north/at greater latitudes; White geese better camouflaged (further north);</p>	3	In order to gain the last marking point, candidates must explain how

Question number	Answer	Marks	Guidance
	Predation linked to survival/reproductive success;		survival or reproductive success is affected.
<b>6 c</b>	Snow melts earlier/snow melts further north / less snow; White geese decreasing as less well camouflaged/at disadvantage/blue geese increasing as better camouflaged/at an advantage;	2	
<b>6 d i</b>	Stabilising	1	Do not accept stable.
<b>6 d ii</b>	Few geese survive at the extremes/most survive from the middle of the range.	1	