

4(a)	1 diploid ; 2 allele ; 3 dominant (allele) ;
4(b)	<i>any four from:</i> 1 CDV acts as a selection pressure ; 2 DNA / allele, for black (coat) gives <u>resistance</u> to CDV or DNA / allele, for black (coat), gives (selective) advantage / is selected for, if / when, CDV is common / dogs are common ; <i>in the south (context must be established at least once):</i> 3 more CDV (infection) in <u>wolves</u> ; 4 black wolves, more likely to survive / have selective advantage / are selected <u>for</u> ; ORA greys 5 black wolves more likely to, breed / reproduce ; ORA greys 6 pass on / increase the frequency of, <u>allele</u> for black coat ; ORA grey
4(c)	1 positive (linear) correlation / positive relationship / direct relationship / directly proportional or as % with (anti-CDV) antibodies increases the % of black wolves increases ; <i>plus any three from:</i> 2 wolves that survive CDV will, later / as a result, have antibodies ; 3 high % of antibodies show population with high level of CDV ; 4 in population with high % antibodies, grey wolves have died / more black wolves are left ; 5 gene / DNA / allele / protein, that gives black coat, helps survival / gives resistance to CDV / defends against CDV ; 6 AVP ;

2(a)(i)			
		<i>E. turcicum</i>	<i>Z. mays</i>
	1 structural difference	chitin cell wall or no chloroplasts or hyphae / cells long and branching or syncytial / multinucleate / several nuclei per cell	cellulose cell wall or chloroplasts or no hyphae / cells not long and branching or one nucleus per cell ;
	2 functional difference	heterotroph(ic) / parasitic / obtain food from host / do not photosynthesise	autotroph(ic) / phototrophic / photosynthesis(e) ;
2(a)(ii)	<i>any four from:</i> 1 large groups divide into smaller groups ; 2 common / similar / shared, features within a group ; 3 <i>ref. three of:</i> kingdom – phylum – class – order – family ; 4 genus and species = binomial / Linnaean / Latin / scientific, name ; 5 (both in domain) Eukarya ; 6 different kingdoms / Fungi and Plantae ;		
2(b)(i)	<i>any two from:</i> 1 low percentage leaf damage means high resistance (to infection) ; 2 SKV50 = 22% <u>and</u> CML153 = 58% ; 3 SKV50 shows greater resistance (to infection) ;		
2(b)(ii)	continuous ;		

2(b)(iii)	any four from: 1 many / different / several / multiple, genes ; 2 affect, same trait / (percentage) area of leaf damage / resistance ; 3 <u>alleles</u> of, one / each, gene have a small effect ; 4 (different) <u>genes</u> have, additive / combined / interactive, effects ; 5 mathematical treatment to illustrate additive effect ;
-----------	---

4(a)(i)	0.3 ;
4(a)(ii)	any four from: 1 genetic drift ; 2 (drift as) frequency, fluctuates / decreases and increases / shows random changes / does not change markedly in just one direction ; 3 <u>directional</u> selection ; 4 from (generation) 2 to 7 / at first, T decreases as, T is selected against <u>and</u> from (generation) 7 to 13 / later, T increased as, T is selected for; 5 may be, stabilising selection / selection for heterozygotes ; 6 (stabilising selection) keeps relative allele frequencies roughly the same ;
4(b)	any three from: 1 small(er) population ; 2 causes (genetic) bottleneck (effect) ; 3 chance events, have greater relative effect on / cause larger fluctuations in, allele frequency ; 4 more likely for one allele to, replace another / go extinct / become fixed ; 5 by chance T organisms, did not mate / pass on T allele or by chance offspring with T died ;
4(c)	<u>Hardy-Weinberg</u> ;