Question Number	Answer	Mark
***1(a)QWC**	**Take into account quality of written communication when awarding the following points.** 1. idea that there are four chambers ; 2. correct reference to relative position of *atria* and *ventricles* ; 3. idea of left and right sides separate / *septum* ; 4. reference to muscular nature of walls ; 5. reference to *cardiac* muscle ; 6. idea of relative thickness of *ventricle* (walls) ; 7. correct reference to position of {*atrioventricular valves* / eq} ; 8. correct reference to position of *semilunar valves* ; 9. reference to position of {*tendons / tendinous cords / papillary muscles* / eq} ; 10. correct reference to position of {*aorta / pulmonary artery}* ; 11. correct reference to position of {*vena cava / pulmonary vein}* ; 12. correct reference to *coronary arteries* ; 13. reference to {*SAN / Sino Atrial Node / pacemaker/ AVN /Atrioventricular Node / Purkinje fibres /Purkyne fibres / Bundle of His/eq } ;*	**(5)**

Question Number	Answer	Mark
1(b)	1. idea that the heart has to pump blood a long way around the body of the giraffe ; 2. (therefore) blood needs to be (pumped) at high pressure / eq; 3. blood vessels are needed to contain the blood / reference to closed circulation / eq ; 4. idea of double circulatory system ; 5. capillaries needed to ensure that all parts of giraffe are close to blood supply/ eq ; 6. idea of need for a circulation to {provide oxygen / remove carbon dioxide / other correct named substance} ; 7. idea of {oxygen / glucose} needed as {high metabolic rate / high rate of respiration / eq} ; 8. idea of diffusion not meeting the requirements of the giraffe ; 9. reference to low surface area to volume ratio ; 10. idea that circulatory system helps regulation of body temperature ;	**(4)**

Question Number	Answer	Mark
2(a)	1. idea of taller (growing) plants could {develop / grow} in the clear areas ; 2. idea of loss of {low-growing plants / clear zones} ; 3. idea that different animals appear ; 4. reference to (secondary) succession ; 5. reference to climax community (of the taller plants) ;	**(3)**

Question Number	Answer	Mark
2(b)(i)	1. named abiotic factor ; 2. appropriate description of how named factor affects the {number / distribution / growth / eq} of these plants ; 3. appropriate explanation ;	**(3)**

Question Number	Answer	Mark
2(b)(ii)	1. idea of no {(inter) breeding / reproduction / mating / eq} (between the *B. Selene*); 2. (because) {geographical / physical} barrier / eq ; 3. idea of different behaviour ; 4. idea of incompatible genitalia ; 5. idea of each population having a {discrete / eq} gene pool e.g. restricted gene flow, different mutations, different alleles ;	**(3)**

Question Number	Answer	Mark
2(b)(iii)	1. {low-growing plants would die out / eq } / {taller plants would outgrow the low-growing plants / eq} ; 2. idea of (*B. Selene*) unable to feed e.g. no nectar (for the adults) ; 3. (*B.selene*) unable to lay eggs / eq ; 4. no suitable plants for {caterpillars / eq } to feed on / eq ; 5. idea of very little {variation / genetic diversity / eq} in a small population ;	**(3)**

Question Number	Answer	Mark
3(a)(i)	(the total of) all the alleles in a {population / eq} ;	**(1)**

Question Number	Answer	Mark
3(a)(ii)	the {proportion of / number of times occurring / eq} for one allele within a {gene pool / population / eq) ;	**(1)**

Question Number	Answer	Mark
3(b)(i)	1. if allowed to interbreed / eq ; 2. sub-species could (probably) produce fertile offspring / eq ;	**(2)**

Question Number	Answer	Mark
3(b)(ii)	(QWC – Spelling of technical terms must be correct and the answer must be organised in a logical sequence) 1. reference to a few *(ancestral)* boar reaching the island ; 2. reference to (two populations) {*geographical* separation / separated by the sea / volcanic eruptions / eq} ; 3. populations {cannot *interbreed* / eq} ; 4. idea of gene flow between populations {prevented / restricted} ; 5. only a small number (on island) of other boar for breeding / reference to *founder* effect / eq ; 6. reference to {restricted / limited / eq} variety of *alleles* / eq ; 7. reference to *mutations* ; 8. different {*environmental* conditions / *selection pressures* / eq} on island different from mainland ; 9. reference to changes in *allele frequencies* ; 10. (leads to) {*phenotypic* / *physiological* / *physical* / *behavioural*} changes ; 11. reference to possibility of (*allopatric*) *speciation* ;	**max (5)**

Question Number	Answer	Mark
3(b)(iii)	1. reference to {bands / eq} produced ; 2. reference to {bands / eq} at certain {positions / eq} ; 3. common {bands / eq} contain similar {DNA fragments / eq} ; 4. idea that the more similar the patterns the {closer the relationship / more likely to have {recent / eq} common ancestor} ; 5. idea that very few differences if still a sub-species ;	**max (3)**

Question Number	Answer	Mark
4(a)	**Ni** 1. the {role / function / eq} (of a species / organism) ; 2. {within the community / ecosystem /habitat / environment / eq } ; **Species richness:** 3. number of (different) species ; 4. in a {habitat / eq } / at any one time ;	**max (3)**

Question Number	Answer	Mark
***4 (b)(i)QWC**	(QWC – Spelling of technical terms must be correct and the answer must be organised in a logical sequence) 1. (cheetah has) {lowest genetic diversity / least genetic variation } (of the listed cats) ; 2. correct reference to lack of adaptation / example / no selective advantage (when environment changes) ; 3. (therefore) less likely to survive / eq ; 4. (therefore) more at risk of {extinction / eq} ;	**max (3)**

Question Number	Answer	Mark
4 (b)(ii)	1. {greater / eq} genetic diversity (amongst the litter) / eq ; 2. greater chance that will {survive / eq} ; 3. increased chance of fertilisation / pregnancy / eq ; 4. increase in population size / eq ;	**max (2)**

Question Number	Answer	Mark
4 (c)	1. increases genetic diversity /eq ; 2. (because it) allows {outbreeding / mating / eq} with (genetically) different individuals / eq ; 3. stop/reduces {inbreeding / mating with parents / siblings} ; 4. (which) reduces genetic diversity / eq ;	**max (2)**

Question Number	Answer	Mark
4 (d)	cheetahs that are exclusive to one continent ;	**(1)**