Question Number	Answer	Mark
1 (a) (i)	(7mm / largest seed size) because has greatest germination success ;	**(1)**

Question Number	Answer	Mark
1 (a) (ii)	1. correct values from graph, i.e. 4 (au) and 20 (au) ; 2. correct subtraction e.g. 20 - 4 = 16 ; 3. (change ÷ original) X 100 to give correct answer, e.g. (16 / 4) x 100 = 400% ; For correct answer of 400% - 3 marks	**(3)**

Question Number	Answer	Mark
1 (a) (iii)	1. idea of maintaining or increasing {genetic diversity / size of gene pool / genetic variation} ; 2. idea of more chance of having beneficial alleles / eq ; 3. increases chance of future survival {if environment changes / due to higher adaptability } / eq ; 4. less chance of all being susceptible to a disease / eq ;	**(3)**

Question Number	Answer	Mark
1 (b)	1. details of assessment of seed viability e.g. only select seeds with a living embryo, use of X ray (to detect embryo presence) / eq ; 2. idea of {cleaning seeds / surface sterilisation / eq} ; 3. idea of drying (of the seed) ; 4. idea of storing at low temperatures ; 5. idea of regularly testing viability (during storage of seed) ; 6. idea of what to do if viability decreases, e.g. if less than 75% germinate collect fresh seed for storage ;	**(4)**

Question Number	Answer	Mark
2 (a)	1. year 1 ; 2. {more / eq } species present (in year 1) / greater variety of species ; Ignore references to abundance.	**(2)**

Question Number	Answer	Mark
2 (b)(i)	mitosis ;	**(1)**

Question Number	Answer	Mark
2 (b)(ii)	1. low genetic diversity is {few / low number of / less / eq} different <u>alleles</u> in the {gene pool / population / species} / small gene pool / eq ; 2. (asexual reproduction leads to) all offspring being {<u>genetically</u> identical / clones / same genotype / same <u>alleles</u> } ; 3. no meiosis/ no recombination of genetic material / eq; 4. idea of variation only possible as a result of mutation ;	**(2)**

Question Number	Answer	Mark
*** 2 (c)**	(QWC – Spelling of technical terms must be correct and the answer must be organised in a logical sequence) 1. (description of how to vary the independent variable) Idea of at least 5 different nitrate (ion) concentrations ; 2. Reference to repeats at each concentration ; 3. (measuring of dependent variable) Increase in {length/mass/ height} ; 4. use plants that are genetically {similar / same} / same age / same original {height/ size / mass} of plant ; 5. & 6. Controlling abiotic factors, maximum 2 from list: • time (at least a week) allowed for growth • other mineral ions constant • temperature • light (intensity) • water provided • pH of {solution / soil} • CO_2 concentration ;; 7. idea of control described, e.g. no nitrate/ soil with no extra nitrate ;	**(5)**

Question Number	Answer	Mark
3(a) (i)	A ;	**(1)**

Question Number	Answer	Mark
3(a) (ii)	C ;	**(1)**

Question Number	Answer	Mark
3(a)(iii)	1. D ; Any two from: 2. idea that endemic means species restricted to one (geographical) area ; 3. {a species/ flag shape } only present in (Area D/Box 4) ; 4. all other shapes appear in {at least one other box / more than one area} ;	**(3)**

Question Number	Answer	Mark
***3(b)QWC**	(QWC – Spelling of technical terms must be correct and the answer must be organised in a logical sequence) **General points:** 1. to increase numbers/population size ; 2. to {maintain / increase} genetic diversity/ reduce genetic drift / eq ; 3. protect from {predators / poachers / eq} / eq ; **For captive breeding** 4. inter-zoo animal movement / eq ; 5. selection of mates / use of stud books / records kept of breeding programme / eq ; 6. process involved described e.g. IVF / AI / use of surrogates / DNA profiling / eq ; **For reintroduction** 7. preparation for reintroduction described e.g. idea of reinforcing wild behaviour / idea of hacking out / reduce food intake to encourage hunting ; 8. select {habitat / reserves} ; 9. raise {awareness / education} of local population / eq ;	**(5)**

Question Number	Answer	Mark
4 (a)	1. idea that, GD considers one species but SR considers {different / number} species ; 2. idea that, GD considers {alleles / genotypes / eq} but SR is within a {habitat / area / eq };	**(2)**

Question Number	Answer	Mark
4 (b)(i)	1. take {less / smaller} space / eq ; 2. can have more individuals / eq ; 3. reference to {greater / more} genetic variety ; 4. idea of less {maintenance / cost} ; 5. likely to survive longer / eq ; 6. can freeze seeds / eq ;	**max (2)**

Question Number	Answer	Mark
4 (b)(ii)	1. idea of {greater / maintain} genetic variety e.g. wider gene pool, different alleles ; 2. idea of less chance of inbreeding ; 3. idea of reducing chance of storing seeds with {low viability / disease / eq} ;	**max (2)**

Question Number	Answer	Mark
4 (c)(i)	correct working shown e.g. (3/48) x 100 ; correct answer = {6.3 / 6.25} ; <u>Note:</u> 2 marks for correct answer 1 mark for incorrect answer but correct working	**(2)**

Question Number	Answer	Mark
4(c)(ii)	1. species B ; 2. lowest germination success / eq ; 3. idea that decrease in mean germination success is the greatest after drying ; 4. credit manipulated figures e.g. 17 less after drying, planted immediately is 8 lower than highest{A / D}, after drying 22 less than highest {A /C} ;	**max (3)**

Question Number	Answer	Mark
4 (c)(iii)	1. reference to drying ; 2. reference to sterilisation / fungicide ; 3. reference to low temperature e.q. freezing, cool ; 4. reference to low oxygen / eq; 5. reference to low humidity/ eq ; 6. reference to absence of light / eq; 7. reference to check viability e.g. germination / embryo presence / eq;	**max (2)**