1)

(a)(i)	Diffusion;	1	Ignore references to structures, membrane components etc Allow simple diffusion Reject facilitated diffusion
(a)(ii)	1. (Thin / flat body) so short distance for diffusion / short diffusion pathway; 2. (Thin / flat body so) large surface area to volume ratio;	2	Ignore references to membrane, wall, body surface 'It' refers to flatworm's body
(b)(i)	A group of tissues;	1	Ignore references to function Group = more than one
(b)(ii)	1. (Carbon dioxide enters) via stomata; 2. (Stomata opened by) guard cells; 3. Diffuses through air spaces; 4. Down diffusion gradient;	3 max	1. Reject stroma 3. Allow concentration gradient. Reject along gradient unless direction made clear

2)

(a)	2 of the following pairs: 1. Larger leaves; 2. Photosynthesis; *OR* 3. Larger/bigger/thicker root; 4. Storage; *OR* 5. Stem shorter / absent; 6. Less energy used in stem growth / more energy for producing sugar;	4 max	Mark for explanation must be paired with correct change in structure Accept converse descriptions of leaves, root and stem: longer root, taller stem, smaller leaves Accept converse correct explanation
(b)	Beet ready quicker / less time required / allows land to be used again / harvested earlier;	1	Allow more crops/many harvests. Ignore references to yield / profit
(c)	1. (Diversity) reduced / fewer different alleles / less variation / smaller gene pool; 2. As alleles have been chosen / rejected;	2	

3)

(a)(i)	Kingdom / phylum / class;	1	Accept Animalia /animal kingdom / Chordata / Chordates / Aves Allow phonetic spelling
a)(ii)	Family;	1	
(b)(i)	1. Shows the spread of the data / how data varies; 2. Overlap = no difference / due to chance / not significant; 3. Low SD means results more reliable / repeatable;	2 max	1. Reject range. Accept varies from the mean 2. Allow converse 3. Ignore accurate/valid/
b)(ii)	1. Different colour/different feathers/different throat; 2. Birds don't mate/pair bond with/recognise other species;	2	2. Reference to courtship alone is not sufficient
5(c)	1. Different species would have different amino acid sequences; 2. Amino acid sequence is the result of DNA/alleles//base sequence;	2	Accept more closely related = more similar sequence References to incorrect statements about coding negates second mark

4)

(a)	Removes bias;	1	
b)(i)	1. 1.28 / 1.29 / 1.285 / 1.3;; 2. Answer incorrect but shows clear understanding of Σ;	2	1. Ignore more than 3dp 2. ∑ = 318250. Allow mark if denominator written out. Incorrect denominator but evidence of understanding gains mark
)(ii)	Diversity index would be lower (NO MARK) 1. Fewer species / Beech aphid/Large white butterfly/7-spot ladybird absent /only three species / species diversity lower; 2. Mostly one species / mostly bird-cherry aphid; 3. Fewer plant species;	2 max	Assume wheat field if site unspecified 1. Allow species richness in context of few species 3. Allow one type of food source if clearly plant

(c)	For: 1. Data support the claim / evidence supports claim; Against: 2. Only wheat field / only comparing with wood / one type of habitat /only insects considered;	2 max	1. Ignore reference to correlation/causation
(d)	1. Greater variety of plants; 2. Another habitat / more habitats / places to live / niches; 3. Another food source / more food types;	2 max	3. Answers referring to 'more food' should not be credited. Allow reference to either animal or plant as foods

5)

a)(i)	1. Stomata open; 2. Transpiration highest around mid-day; 3. Middle of day warmer / lighter; 4. (Increased) tension / water potential gradient; 5. Cohesion (between water molecules);	3 max	Allow converse 3. Allow 'Sun is at it's hottest' Ignore 'pull, suck' Reject increased cohesion in the context of cohesion tension
a)(ii)	(Inside xylem) lower than atmospheric pressure / (water is under) tension;	1	Accept cohesion tension. Ignore vacuum
b)(i)	High pressure / smoothes out blood flow / artery wall contains more collagen / muscle / elastic (fibres) / connective tissue;	1	Accept converse for pulmonary vein Incorrect function of artery disqualifies mark
b)(ii)	1. (Aorta wall) stretches; 2. Because ventricle/heart contracts / systole / pressure increases; 3. (Aorta wall) recoils; 4. Because ventricle relaxes / heart relaxes /diastole / pressure falls; 5. Maintain smooth flow / pressure;	3 max	1. Allow expand 2. Reject if MP1 wrong 3. Allow spring back Reject any reference to contract / relax in MP1 and 3 4. Reject if MP3 wrong
b)(iii)	Aorta 1.2 / largest SD;	1	Allow pulmonary vein provided candidate relates standard deviation to mean
(c)	Formation 1. High blood / hydrostatic pressure / pressure filtration; 2. Forces water / fluid out; 3. Large proteins remain in capillary; Return 4. Low water potential in capillary / blood; 5. Due to (plasma) proteins; 6. Water enters capillary / blood; 7. (By) osmosis; 8. Correct reference to lymph;	6 max	 2. Reject plasma, ignore tissue 7. Osmosis must be in correct context

6)

(c)	1. Mutation; 2. Horizontal transmission / conjugation;	2	Ignore reference to vertical transmission Allow description. Reject 'conjunction'
(d)	Age affects immune system / heart / teeth;	1	Ignore any other variable

7)

(a)(i)	Phylum, Class, Order, Genus; Mantophasma (M)/(Mantophasma) zephyra;	2	
(a)(ii)	Groups within (larger) groups; No overlap;	2	
(b)	Comparison of/look for similar features/structures/appearance;	1	

8)

(a)	Increase in/more carbon dioxide; Curve moves to the right/depressed;	2	Q Any reference to haemoglobin increasing affinity for oxygen disqualifies second mark point.
(b)(i)	More haemoglobin; So can load/pick up more oxygen (in the lungs);	2	Q Second mark point must relate to idea of loading oxygen. Answers referring only to transport of oxygen should not be credited this mark.
(b)(ii)	(Haemoglobin) has lower affinity for oxygen / more oxygen released; In/to the cells/ tissues;	2	