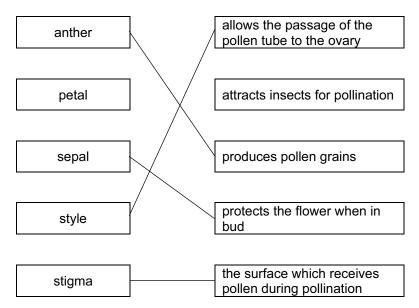| Question	E	Answers	Marks	Additional Guidance
1 (a)		broad leaves / *Ranunculus* does not have narrow leaves / AW **;** branched veins / not parallel veins **;** flower parts, in 5s / not in 3s **; R** 'flowers in fives'	[max 2]	**A** wide / large surface area **A** net(work) of veins / reticulate **I** two cotyledons
(b)	1 2 3 4 5 6 7 8 9	(cells of **W** were) in, the winter / cold / low light / short days / AW **;** **I** refs. to water starch, has been used / converted to glucose *or* sugar / broken down **;** to provide energy **; R** 'produce' in respiration **;** to keep the, plant / cells, alive **; I** for growth, etc. root has become a source (not a sink) **;** when there has been, no / few, leaves **;** so there has been, no / little / less, photosynthesis **;** ref. to, light / temperature / cold, as limiting factor(s) **;**	[max 3]	*assume answers refer to **W** unless told otherwise – accept ORA for **S*** **1** (cells of **S** were) in summer / warm / high light / AW **; I** refs. to water **2** starch has been, stored / produced **;** **8** result of (more) photosynthesis **;** **6** root is a sink (not a source) **;** **7** many leaves **;**
(c)	1 2 3 4 5 6 7 8 9	sucrose / sugar, transported / translocated **; A** travels / in phloem glucose / monosaccharide **;** joined together (by chemical bonds) **; R** if refers to joining sucrose condensation reaction / described **;** glucose added to growing chain / AW **;** (starch is a) long / chain, molecule **; A** is a polysaccharide enzyme provides active site for reaction **;** enzyme, catalyses / speeds up, the reaction **;** ref. to lock and key (model) **;**	[max 3]	*if given breakdown of starch award MP6 to 9 only* **A** 'join together to make maltose' **A** polymer / polymerisation **A** enzyme(s) is/are (biological) catalyst(s)

Question	E	Answers	Marks	Additional Guidance
1 (d)	1 2 3 4 5	increase in (kinetic) energy **;** more, collisions / AW **;** between, enzyme / active site, and, substrate / AW **;** ref. to optimum temperature / works best at ≈ 30 ^{o}C **;** <u>denatured</u>, at high temperature / above 30 ^{o}C / above optimum **;**	 [max 2]	**I** particles, movement **R** 'destroyed' / 'killed' / 'damaged'
			[Total: 10]	

2 (a *reject lines to or from the same box, e.g. anther and petal to produce pollen grains*
A *if lines do not touch box but meaning is clear*

anther	allows the passage of the pollen tube to the ovary
petal	attracts insects for pollination
sepal	produces pollen grains
style	protects the flower when in bud
stigma	the surface which receives pollen during pollination

[4]

(b) *assume answer is about stigma of wind-pollinated flower unless told otherwise, accept* **ora**, *2 max for differences, 1 or 2 for significance*

wind-pollinated stigma,	insect-pollinated stigma
feathery / hairy ; **R** branched	not, feathery / hairy ;
ignore not sticky	*ignore sticky*
large(r) ; **A** large surface area	small(er) ; **A** small surface area
outside flower / AW ;	inside flower / AW ;
A pendulous / exposed	
ignore long and short	[2 max]

explanation
to catch pollen / AW (in the wind) ; **A** for pollen to attach (to stigma)
or make pollination more likely / easier
increase chance of pollination ;

'more likely to catch pollen' = 2 marks   [max 3]

(c) 1 little / less / AW / no, <u>variation</u> ;   **R** cloning
2 ref to becoming homozygous ; *ignore ref to gene*
3 e.g. of consequence 'good' or 'bad' ;
        e.g. less chance of adapting to changing conditions / less ability to evolve
        may become extinct / adapted variety spreads / AW ;
4 greater chance of pollination / ensures pollination occurs ;
        A reproduction / fertilisation
5 useful if no other plants (of same species) nearby ;
6 less wastage of pollen ;   **A** gametes
7 not dependent on (named) agent of pollination ;   [max 3]

[Total: 10]

3 **(a)** **(i)** ref. to moist skin ; **[1]**

(ii) mammal ;
bird ;
fish ;
reptile ; **[max. 2]**

(b) ref. to both belonging to the same genus (or ref. to Bufo) ; **[1]**
(ignore refs. to both animals being toads)

(c) ref. to sand dunes becoming developed for + camp sites ;

ref. to habitat is changing e.g. to woodland ; Ⓐ ref. to loss of habitat

naterjacks cannot survive in colder habitats AW ; **[max. 2]**

(d) ref. to some heathland or sand dunes becoming protected areas AW ;
ref. to removal of trees / seedling trees AW + from heathland ;
ref. to creation of more heathland / sand dunes + introduction of natterjacks ;
ref. to captive breeding programmes ; **[max. 2]**

(e) secondary consumer / third level ; Ⓐ (top) carnivore **[1]**

(ii) insect larvae + adult insects ; (BOTH NEEDED FOR 1 MARK) **[1]**

(iii) ref. to a wider range of food sources AW ; **[1]**

[max. 11]