

Question 1

question	answers	extra information	mark
1(a)	xylem and phloem	either order allow words ringed in box allow mis-spelling if unambiguous	1
1(b)(i)	movement / spreading out of particles / molecules / ions / atoms	ignore names of substances / 'gases'	1
	from high to low concentration	accept down concentration gradient ignore 'along' / 'across' gradient ignore 'with' gradient	1
1(b)(ii)	oxygen / water (vapour)	allow O ₂ /O ₂ ignore O ² /O allow H ₂ O/H ₂ O ignore H ² O	1
Total			4

Question 4

question	answers	extra information	mark
4(a)	solution in soil is more dilute (than in root cells)	concentration of water higher in the soil (than in root cells)	1
	so water moves from the dilute to the more concentrated region	so water moves <u>down</u> (its) concentration gradient or water moves from a high concentration of <u>water</u> to a lower concentration	1
	concentration of ions in soil less (than that in root cells)		1
	so energy needed to move ions or ions are moved against concentration gradient	the direction of the concentration gradient must be expressed clearly accept correct reference to water potential or to concentrations of water	1
4(b)	any three from: <ul style="list-style-type: none"> • movement of water from roots / root hairs (up stem) • via xylem • to the leaves • (water) evaporates • via stomata 		3
4(c)(i)	0.67/0.7	accept 0.66, 0.666666... or $\frac{2}{3}$ or 0.6 correct answer gains 2 marks with or without working if answer incorrect allow evidence of $\frac{100}{150}$ for 1 mark do not accept 0.6 or 0.70	2

Question 4 continues on the next page . . .

Question 4 continued

question	Answers	extra information	mark
4(c)(ii)	during the first 30 minutes any one from: <ul style="list-style-type: none"> • it was warmer • it was windier • it was less humid • there was more water (vapour) in the leaves 		1
	so there was more evaporation or stomata open during first 30 minutes or closed after 30 minutes (1) so faster (rate of) evaporation in first 30min or reducing (rate of) evaporation after 30min (1)	ignore 'water loss'	1
Total			11

Question	Answers	Extra information	Mark	AO / spec ref.
5(a)(i)	guard (cells)	allow phonetic spelling	1	AO1 3.1.3e
5(a)(ii)	any one from: <ul style="list-style-type: none"> allow carbon dioxide to enter allow oxygen to leave. 	ignore reference to cells allow control loss / evaporation of water or control transpiration rate allow 'gaseous exchange'	1	AO1 3.1.3a, c,e
5(b)(i)	200	correct answer gains 2 marks with or without working allow 1 mark for $0.1 \times 0.1 = 0.01 \text{ (mm}^2\text{)}$	2	AO2 3.1.3
5(b)(ii)	more / a lot of / increased water loss	allow plant more likely to wilt (in hot / dry conditions)	1	AO3 3.1.3d
5(c)(i)	0.12		1	AO2 3.1.3
5(c)(ii)	the lower surface has most stomata stomata are now covered / blocked (by grease) so water cannot escape / evaporate from the stomata	 ignore waterproof to gain credit stomata must be mentioned at least once	1 1 1	AO3 3.1.3c, d
Total			9	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
2(a)	guard (cells)	allow phonetic spelling	1	AO1 3.1.3e
2(b)(i)	as carbon dioxide (concentration) increases, the (mean) number of stomata decreases	allow there is a <u>negative correlation</u>	1	AO2 3.1.3
	(there is a) rapid drop initially	allow use of any number between 1.5 and 3.0 to indicate "initially"	1	
2(b)(ii)	(there is) more carbon dioxide so plant doesn't need as many stomata (to obtain the amount needed) or (there is) less carbon dioxide so the plant needs more stomata (to obtain enough)		1	AO3 3.1.3c
2(c)(i)	may lose too much water	allow plant may wilt ignore references to oxygen / carbon dioxide plants lose a lot of water is insufficient ignore flaccid	1	AO3 3.1.3d
2(c)(ii)	any one from: <ul style="list-style-type: none"> hot dry windy 	ignore environments unqualified eg desert	1	AO3 3.1.3d
Total			6	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
5(a)	<u>xylem</u> transports mineral (ions)	allow <u>xylem</u> transports water	1	AO1 3.2.3a
	<u>phloem</u> transports sugars	allow <u>phloem</u> transports sucrose / glucose / carbohydrate ignore minerals / ions transported in phloem if no other marks given allow one mark for xylem and phloem	1	
5(b)(i)	lost the most water or lost water faster than the others	allow mass decreased the most	1	AO3 3.1.3d
	(it) has the greatest number of stomata (per mm ²)		1	
	(and) water is lost through the stomata		1	
5(b)(ii)	(transpiration rate would be) lower	at least one comparative must be given	1	AO2/3 3.1.3d
	(because) slow(er) evaporation / diffusion (into the air) or (because) concentration gradient will be less	allow 'lower rate of evaporation' for these 2 marks	1	
	(due to) high(er) humidity	allow air becomes saturated	1	
Total			8	

18	(a)		(more water/mass lost when fan is on because) air movement removes water vapour / reduces water vapour concentration outside leaves / increases water vapour concentration gradient (1) so evaporation / diffusion happens more quickly (1)	1 1	2.2 1.2	pressure. allow reverse argument
		(b)	(i) (because otherwise) an increase in light intensity would open stomata (1) increasing transpiration / ORA (1)	1 1	2.2 2.2	
		(ii)	(because otherwise) an increase in temperature would increase evaporation / ORA (1)	1	2.2	