

Question 10 (Answer: **D**)

- A dye rising up a cut stalk travels in the water-transporting tissue.
- That is the xylem, which forms the vascular bundles.
- So a cross-section shows the dye only in the xylem, arranged in a ring or in strands.

3(a)	<i>any two from:</i> (enters) the root hair (cell) ; moves through the (root) cortex (cells to the xylem) ; AVP ;
3(b)(i)	5.8 (g per hour) ;

3(b)(ii)	<i>any four from:</i> 1 as temperature increases, water loss / transpiration, increases ; ora 2 comparative data manipulation with units ; 3 higher <u>kinetic</u> energy (of water molecules) / description of molecules having more energy to, move / collide / AW ; ora 4 increases (the rate of) evaporation (inside leaf) ; ora 5 water evaporates from the surface of mesophyll cells ; 6 increases (the rate of) <u>diffusion</u> (of water vapour) through the <u>stomata</u> ; ora 7 more stomata open / stomata open wider, at high(er) temperatures ; ora
3(b)(iii)	increased rate of transpiration ; increased concentration gradient (of water vapour for diffusion through the stomata) ;
3(b)(iv)	1 (mineral) ions ; 2 tube / vessel / AW ; 3 lignin ; 4 pull ; 5 column / AW ; 6 forces (of attraction) / attraction / AW ;
3(c)(i)	<i>any three from:</i> 1 (plants / cells) exposed to, extreme heat / high temperatures ; 2 (plants / cells have) inadequate / not enough / no, water OR dehydration ; 3 (rate of) water uptake is less than, (rate of) water loss / transpiration ; ora 4 water moves out of cells (by osmosis) ; 5 cells, become flaccid / lose turgor (pressure) / plasmolyse ; 6 <i>ref. to plants / leaves / cells, rely on (turgor) pressure of water on (inelastic) cell walls for, (structural) support</i> <i>/ to stay firm / AW ;</i> 7 AVP ;

3(c)(ii)	<i>any one from:</i> 1 inner surface of leaf is folded / AW ; 2 hairs / AW ; 3 sunken stomata or stomata in, pits / AW ; <i>any two from:</i> 4 trap moist air / water vapour / reduce air, flow / movement ; 5 reduce water (vapour) diffusion gradient (out of stomata) ; OR 6 curled / rolled / AW, leaf ; 7 (rolling) traps air / reduce air movement / shields leaf from heat / reduces exposed surface ; 8 reduce water (vapour) diffusion gradient (out of stomata) ; OR 9 few stomata ; 10 few sites where water exits the leaf / AW ; OR 11 thick (waxy) cuticle ; 12 reduces evaporation (from the leaf surface) / creates a waterproof layer ;
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1(a)(i)	C = 11 and W = 12 ;
1(a)(ii)	table drawn with correct number of columns and a header line ; appropriate column / row headings, with units for distance ; recording of correct number of sections for both C and W ; recording of correct total distances for both C and W ;
1(a)(iii)	6.5 ; mm per minute ;
1(a)(iv)	the <u>higher</u> the temperature the <u>greater</u> the (rate of) dye / water movement ;
1(a)(v)	to identify, anomalous results / outliers / results that do not follow the trend ;
1(b)	<i>any two from:</i> both used celery OR same, species / type, of plant ; length of celery (stalk) ; both used blue dye OR type / colour of dye ; time to equilibrate ; length of time in the dye ; width of sections ;
1(c)(i)	<i>error from Table 1.1</i> temperature (of the water-bath) not controlled / AW ; <i>improvement</i> thermostatically controlled water–bath ;

1(c)(ii)	cut smaller / thinner sections OR cut the celery vertically / longitudinally ;
1(d)	0.28 (mm ³) ;
1(e)(i)	line AB = 60 ±1 (mm) ; 2 (mm) ;;

1(e)(ii)	any three differences from:			
		leaf miner fly / Fig. 1.7		black aphid / Fig. 1.6
	1	larger	OR	smaller
	2	shorter antennae / AW	OR	longer antennae / AW
	3	has wings	AND	no wings
	4	hairs on body	AND	no hairs on body
	5	larger eye	OR	smaller eye
	6	lack of two projections / AW, sticking out of abdomen / back	AND	two projections / AW sticking out of abdomen / back
	7	shorter legs	OR	longer legs
	8	thicker legs	OR	thinner legs
	9	only three legs (visible)	AND	six legs
10	larger head	OR	smaller head	
;;;				
1(f)	single clear outline with no shading ; drawing larger than half the available space ; detail 1: deep V-shaped cleft correctly located on the upper right third of the leaf ; detail 2: between three and five separate veins coming from the same level at the top of the petiole ;			