

- M1.** (a) active transport 1
- (b) by transpiration stream / pull 1
- in xylem 1
- (c) any **three** in the correct order from:
- mount epidermis on a slide
 - count stomata in one area
 - repeat in four more areas
 - repeat method on other surface of leaf
 - calculate mean
- allow nail varnish film* 3
- (d) 1 1
- allow numbers written out in a line with middle number circled*
- (e) $(44 + 41 + 40 + 42 + 39) / 5 = 41.2$ 1
- 41 1
- allow 41 with no working shown for 2 marks*
- allow 41.2 for 1 mark*
- (f) less water lost

1

so it does not wilt

1

[11]

M2. (a) guard cells 1

(b) (i) any **one** from:

- species / plant
 - length of time
- ignore temperature and size of leaves*

1

(ii) 20

correct answer = 2 marks

accept $\frac{1.6 - 1.28}{1.6} \times 100$

or $\frac{0.32}{1.6} \times 100$

for 1 mark

2

(c) less water loss / transpiration / evaporation

1

(d) hot

1

ignore bright / sunny conditions

dry / low humidity

1

wind(y)

1

[8]

M3.(a) A - atrium

ignore references to right / left

1

B - ventricle

1

(b) (i) muscular

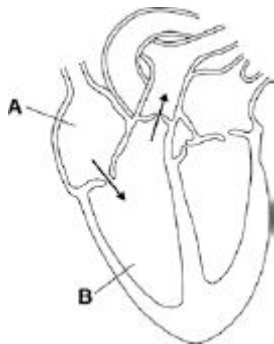
1

(ii) push blood

accept pump / force

1

(c)



arrows approx as indicated

1

arrow(s) showing flow from A to B
from B out / up / to artery

1

(d) (i) male

1

65 and over

1

(ii) fatty deposits / material in (coronary) arteries

allow correct points made about heart attacks

1

narrows / blocks / reduces flow

1

decreases oxygen supply (to heart muscle)

1

[11]

M4. (a) to kill virus
or
to prevent virus spreading 1

(b) take (stem) cells from meristem
or
tissue culture
allow take cuttings 1

(c) use Benedict's solution 1

glucoses turns solution blue to orange 1

(d) **Level 2 (3–4 marks):**
A detailed and coherent explanation is provided. The student makes logical links between clearly identified, relevant points that explain why plants with TMV have stunted growth.

Level 1 (1–2 marks):
Simple statements are made, but not precisely. The logic is unclear.

0 marks:
No relevant content.

Indicative content

- less photosynthesis because of lack of chlorophyll
- therefore less glucose made
so
- less energy released for growth
- because glucose is needed for respiration
and / or
- therefore less amino acids / proteins / cellulose for growth
- because glucose is needed for making amino acids / proteins / cellulose

4

[8]

M5.	(a)	(i)	5.0	1
			(5 × 0.8) or 4	
			<i>allow ecf from distance</i>	1
			0.4	
			<i>allow ecf from 10-min volume</i>	1
		(ii)	increased (rate of uptake)	1
			more transpiration / evaporation	1
	(b)	correct scales		
			<i>allow reversed axes</i>	1
		correctly labelled axes with units		1
		correct points		
			<i>one plot error = max 1 mark</i>	2
		curved line of best fit		
			<i>allow correct straight line</i>	1
	(c)	leaves <u>wilt</u>		1
		because plants lose too much water (by evaporation)		1
		through the <u>stomata</u>		
		or		
		because cells become <u>plasmolysed</u>		
		or		
		<u>stomata</u> close		
		controlled by <u>guard cells</u>		
		to prevent <u>wilting</u>		1