

- 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

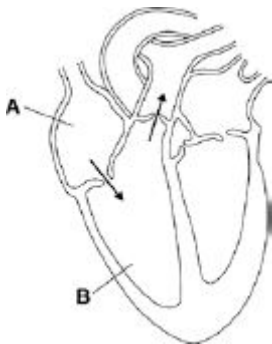
1

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

[13]