M1. (a) (i) diffusion

apply list principle

1

(ii) A

apply list principle

1

(b) (i) osmosis

apply list principle

1

(ii) R

apply list principle

1 [4]
M2. (a) (i) capillary 1

(ii) diffusion 1

(iii) Carbon dioxide

<table>
<thead>
<tr>
<th></th>
<th>low(er)</th>
<th>high(er)</th>
</tr>
</thead>
</table>

Oxygen

<table>
<thead>
<tr>
<th></th>
<th>high(er)</th>
<th>low(er)</th>
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</thead>
</table>

1 mark for each correct row 1

(b) (i) red blood cells 1

(ii) haemoglobin 1
M3.(a) xylem and phloem

either order
allow words ringed in box
allow mis-spelling if unambiguous

(b) (i) movement / spreading out of particles / molecules / ions / atoms
ignore names of substances / ‘gases’

from high to low concentration
accept down concentration gradient
ignore ‘along’ / ‘across’ gradient
ignore ‘with’ gradient

(ii) oxygen / water (vapour)
allow O₂ / O₂
ignore O₂ / O
allow H₂O / H₂O
ignore H₂O

[4]
M4. (a) 300

(b) suitable scale on y-axis

label y-axis

4 bars drawn correctly
allow 1 mark for 3 correct bars

(c) increases from 50 to 500

then decreases from 500 to 0

(d) carbohydrates broken down / digested into sugars

broken down by carbohydrase or amylase

(e) absorption of glucose

into blood
by active transport

allow diffusion
M5.(a)  (i)  A = nucleus

B = (cell) membrane

(ii) any two from:

ignore shape

• no (cell) wall
• no (large / permanent) vacuole
• no chloroplasts / chlorophyll

(b) because high to low oxygen / concentration or down gradient

allow 'more / a lot of oxygen molecules outside.'
ignore along / across gradient

(c) a tissue
M6. (a) osmosis

partially permeable

(b) (i) any two from:

* vacuole is small(er)
* cytoplasm has shrunk
  * allow cytoplasm is smaller
* gap between cytoplasm and cell wall
* cell wall curves inwards
  * allow cell B is flaccid or cell A is turgid
* the (cell) membrane has moved away from the wall

(ii) any one from:

* water will move / diffuse in
* (cells) will swell
* (cells) will burst
  * ignore turgid

(c) villi give the small intestines a large surface area

villi have many blood capillaries
M7.(a) (i) water / $\text{H}_2\text{O}$

- *accept oxygen*
- *allow H$_2$O*
- *do not allow H$^+$ or H$_2$O*

(ii) the mineral ions are absorbed by active transport

- the absorption of mineral ions needs energy

(iii) have (many root) hairs

- (which) give a large surface area (for absorption)

(b) carbon dioxide in

- or
- oxygen out

- or
- control water loss

- *accept gas exchange*
- *ignore gases in and out*
- *ignore gain / lose water*

(c) (i) guard cells

(ii) (stomata are) closed

- *allow there is no gap / space*

(iii) plant will wilt / droop

- *ignore die*

[9]
M8.(a)  

(i) alveoli / alveolus  
  * allow air sacs  
  * allow phonetic spelling  

(ii) any one from:  
  * protection (of lungs / heart)  
  * help you breathe / inflate lungs.

(b)  

(i) diffusion  

(ii) capillaries  

(iii) any two from:  
  * (have many) alveoli  
  * allow air sacs  
  * large surface / area  
  * thin (exchange) surface or short diffusion pathway  
  * accept only one / two cell(s) thick  
  * good blood supply / many capillaries  
  * allow (kept) ventilated or maintained concentration gradient.