GCSE BIOLOGY
AQA - COMBINED SCIENCE
MARK SCHEME

B1
CELL BIOLOGY
TEST 3
Mark schemes

(a) stoma / stomata

ignore pore

(b) guard (cell)

(c) osmosis

in this order only

transpiration

(d) increasing temperature

increasing wind speed

(e) any one from:

• for photosynthesis
• to bring mineral (ions) into / up the plant
  allow correctly named ions e.g. nitrates
• translocation
  allow to cool the plant

(f) any one from:

• decreased transpiration
  allow no transpiration

• less water lost
  allow no water lost

(g) \[ \frac{12}{800} \]

0.015 (millimetres)

15 (micrometres)

allow 1 mark for incorrect width $\times 1000$

an answer of 15 (micrometres) scores 3 marks
(a) measure the mass / length of the chip at the start*

measure the mass / length of the chip at the end*

*if neither mark awarded allow 1 mark for measure the increase in length / mass

divid the change in mass / length by time taken

ignore references to blotting the potato chips

(b) use cork borer

allow a description
allow a potato chip cutter

(c) (rate) would be higher / faster

ignore more diffusion / osmosis

(as) surface area (for diffusion / osmosis) is greater

(d) (as temperature increases the) rate (of osmosis) would increase

ignore more water taken in

as (water) molecules / particles have more energy to move (faster) or as (water) molecules / particles have more kinetic energy

allow (water) molecules / particles move faster
(f) Stem cells from embryos can become more types of cell

allow converse

allow (stem cells from embryos) are pluripotent

(g) Less risk of rejection of umbilical cord stem cells

(h) Could cause cancer

(i) Any one from:

- Embryos are created (for this purpose)
- Embryos are destroyed
- The embryos do not develop into a foetus / child

ignore religious objections

(a) Any one from (bacterial cell):

- Has a cell wall
- Has plasmids

allow converse

- Has a single DNA loop
- Has no nucleus
- Is much smaller

4

(b) $14.50 \times 3 = 43.5$

$43.5 + 14.50 = 58$

or

$14.50 \times 4 = 58$

allow 58 for 2 marks

$(58 / 100000 =)$

0.00058 or 0.058%

an answer of 0.00058 or 0.058% scores 3 marks

(c) Decreased (from 2006 to 2014)

(d) Improved hygiene (for food preparation)

allow stricter food hygiene regulations

vaccination of poultry

[10]
(e) any one from:
- warmer weather so number of bacteria increases faster
- more cold / precooked food (rather than hot food) being eaten
- food not cooked properly on barbeques

(a) 0.27 (g)

(b) potato lost mass
   allow potato (cells) lost water

(c) all 3 points plotted correctly
   allow ecf from art (a)
   allow 1 mark for 1 or 2 correct plots

   suitable line of best fit
   allow ecf from their plots

(d) 2.6 (arbitrary units)
   allow answer from their line

(e) same concentration as inside potato (cells)
   (so) no (net) movement of water
   allow description of this

   by osmosis

(a) any two adaptations with linked descriptions from:
- many alveoli to provide a large surface area
- good blood supply to maintain steep diffusion / concentration gradient
- thin walls so gases do not have far to diffuse / travel
- well ventilated to maintain steep diffusion / concentration gradient
  1 mark for adaptation and 1 mark for linked description
  allow to collect oxygen or to bring carbon dioxide to lungs

(b) an allergy
(c) any one from:
- narrow(er) / small(er) (air) passages / bronchioles
- less air / oxygen can pass through

(d) 3.3 (dm\(^3\))

(e) any one from:
- fake drug
- inactive form of drug

(f) neither the volunteers nor the scientists

(g) to avoid / reduce bias

(h) any two from:
- drug only works for severe asthma attacks or
drug only increased lung capacity in severe asthma attacks
- drug had little effect or slight reduction in healthy people
- drug had no effect in mild asthma attacks
- drug does not alleviate the problem entirely

(a) nucleus

    cell wall

(b) any one from:
- contain (many) chloroplasts
- positioned near the top surface of the leaf
- packed closely together
<table>
<thead>
<tr>
<th>Structure</th>
<th>Tissue</th>
<th>Organ</th>
<th>Organ system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leaf</td>
<td>✔</td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>Xylem</td>
<td>✔</td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>Roots, stem and</td>
<td></td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>leaves</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Additional tick in a row negates the credit for that row.

Allow 1 mark for two correct rows.

(d) \( \times 4 \)  

Reason: any one from:
- Gives the largest field of view
- Easier to focus

(e) Eyepiece lens: \( \times 10 \)  
    **and**  
    Objective lens: \( \times 40 \)

Or

Eyepiece lens: \( \times 5 \)  
    **and**  
    Objective lens: \( \times 80 \)

Allow sensible suggestions that give a magnification of \( \times 400 \)

(f) 12.4 (mm)

Allow 12 (mm)

(e) Real width = \[ \frac{12.4}{400} \]

0.031 (mm)

An answer of 0.031 (mm) scores 2 marks

Allow ecf from part (f)

[11]