

# GCSE

BIOLOGY

AQA - COMBINED SCIENCE

MARK SCHEME

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B1

CELL BIOLOGY

TEST 3

## Mark schemes

1

(a) stoma / stomata  
*ignore pore*

1

(b) guard (cell)

1

(c) osmosis

*in this order only*

1

transpiration

1

(d) increasing temperature

1

increasing wind speed

1

(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*

1

(f) any **one** from:

- decreased transpiration  
*allow no transpiration*

- less water lost

*allow no water lost*

1

(g)  $\frac{12}{800}$

1

0.015 (millimetres)

1

15 (micrometres)

*allow 1 mark for incorrect width  $\times 1000$*

1

*an answer of 15 (micrometres) scores 3 marks*

[11]

<b>2</b>	(a) measure the mass / length of the chip at the start*	1
	measure the mass / length of the chip at the end*	1
	<i>*if neither mark awarded allow 1 mark for measure the increase in length / mass</i>	
	divide the change in mass / length by time taken	1
	<i>ignore references to blotting the potato chips</i>	
	(b) use cork borer	
	<i>allow a description</i>	
	<i>allow a potato chip cutter</i>	1
	(c) (rate) would be higher / faster	
	<i>ignore more diffusion / osmosis</i>	1
	(as) surface area (for diffusion / osmosis) is greater	1
	(d) (as temperature increases the) rate (of osmosis) would increase	
	<i>ignore more water taken in</i>	1
	as (water) molecules / particles have more energy to move (faster)	
	<b>or</b>	
	as (water) molecules / particles have more kinetic energy	
	<i>allow (water) molecules / particles move faster</i>	1
		<b>[8]</b>
<b>3</b>	(a) 46	1
	(b) mitosis	1
	(c) 3	1
	(d) differentiation	1
	(e) cell membrane	1
	cytoplasm	1

- (f) (stem cells from embryos) can become more types of cell  
*allow converse*  
*allow (stem cells from embryos) are pluripotent* 1
- (g) less risk of rejection of umbilical cord stem cells 1
- (h) could cause cancer 1
- (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* 1
- [10]**

**4**

- (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 1
- (b)  $14.50 \times 3 = 43.5$   
 $43.5 + 14.50 = 58$   
**or**  
 $14.50 \times 4 = 58$   
*allow 58 for 2 marks* 1
- $(58 / 100000 =)$   
 0.00058 or 0.058%  
*an answer of 0.00058 or 0.058% scores 3 marks* 1
- (c) decreased (from 2006 to 2014) 1
- (d) improved hygiene (for food preparation)  
*allow stricter food hygiene regulations* 1
- vaccination of poultry 1

- (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

1

[8]

5

(a) 0.27 (g)

1

(b) potato lost mass

*allow potato (cells) lost water*

1

(c) all 3 points plotted correctly

*allow ecf from art (a)*

*allow 1 mark for 1 or 2 correct plots*

2

suitable line of best fit

*allow ecf from their plots*

1

(d) 2.6 (arbitrary units)

*allow answer from their line*

1

(e) same concentration as inside potato (cells)

1

(so) no (net) movement of water

*allow description of this*

1

by osmosis

1

[9]

6

(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*

4

(b) an allergy

1

- (c) any **one** from:
- narrow(er) / small(er) (air) passages / bronchioles
  - less air / oxygen can pass through
- 1
- (d) 3.3 (dm<sup>3</sup>)
- 1
- (e) any **one** from:
- fake drug
  - inactive form of drug
- 1
- (f) neither the volunteers nor the scientists
- 1
- (g) to avoid / reduce bias
- 1
- (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
- 2
- [12]**
- 7** (a) nucleus
- 1
- cell wall
- 1
- (b) any **one** from:
- contain (many) chloroplasts
  - positioned near the top surface of the leaf
  - packed closely together
- 1

(c)

Structure	Tissue	Organ	Organ system
Leaf		✓	
Xylem	✓		
Roots, stem and leaves			✓

additional tick in a row negates the credit for that row

allow **1** mark for two correct rows

2

(d) x4

1

reason: any **one** from:

- gives the largest field of view
- easier to focus

1

(e) eyepiece lens: x10  
**and**  
objective lens: x40

**or**

eyepiece lens: x5  
**and**  
objective lens: x80

*allow sensible suggestions that give a magnification of x400*

1

(f) 12.4 (mm)

*allow 12 (mm)*

1

(e) real width =  $\frac{12.4}{400}$

1

0.031 (mm)

*an answer of 0.031 (mm) scores 2 marks*

*allow ecf from part (f)*

1

[11]