

Cell Structure

Mark Scheme 1

Level	GCSE (9-1)
Subject	Combined Science: Trilogy - Biology
Exam Board	AQA
Topic	4.1 Cell Biology
Sub-Topic	Cell Structure
Difficulty Level	Silver Level
Booklet	Mark Scheme 1

Time Allowed: 48 minutes

Score: /48

Percentage: /100

Grade Boundaries:

M1.(a)	asexual reproduction	1
	(b) mitosis	1
	(c) clones	1
	(d) 44	1
		[4]
M2.(a)	$\text{magnification} = \frac{\text{image size}}{\text{real size}}$ $= 29 \div 0.03$ $= 967$ <p><i>allow 967 with no working shown for 2 marks</i></p>	1
	(b) they are transverse	1
	(c) wave speed = frequency × wavelength <i>allow $v = f \lambda$</i>	1

(d) $75 \text{ cm} = 0.75 \text{ m}$

1

$$1.6 = f \times 0.75$$

1

$$f = 1.6 \div 0.75$$

1

$$= 2.13 \text{ (Hz)}$$

1

allow 2.13 (Hz) with no working shown for 4 marks

[8]

M3.(a) (i) nucleus

1

(ii) diffusion

1

(b) increases / larger surface area (for diffusion)

ignore large surface area to volume ratio

1

(c) (i) sugar / glucose

accept amino acids / other named monosaccharides

1

(ii) against a concentration gradient

or

from low to high concentration

1

(iii) (active transport requires) energy

1

(from) respiration

1

(d) minerals / ions

accept named ion ignore nutrients

do not accept water

1

[8]

M4.(a) contract / shorten

ignore relax

do not allow expand

1

to churn / move / mix food

accept peristalsis / mechanical digestion

ignore movement unqualified

1

(b) 400

acceptable range 390-410

allow 1 mark for answer in range of 39 to 41

allow 1 mark for answer in range of 3900 to 4100

2

(c) to transfer energy for use

allow to release / give / supply / provide energy

do not allow to 'make' / ☐ produce' / 'create' energy

allow to make ATP

ignore to store energy

1

by (aerobic) respiration **or** from glucose

do not allow anaerobic

*energy released **for** respiration = max 1 mark*

			1	
(d)	(i)	to make protein / enzyme <i>ignore 'antibody' or other named protein</i>	1	
	(ii)	too small / very small <i>allow light microscope does not have sufficient magnification / resolution</i> <i>allow ribosomes are smaller than mitochondria</i> <i>ignore not sensitive enough</i> <i>ignore ribosomes are transparent</i>	1	[8]
M5.(a)	(i)	chloroplast	1	
	(ii)	cell wall	1	
(b)	(i)	osmosis <i>accept diffusion</i>	1	
	(ii)	cell wall (prevents bursting)	1	
(c)	(i)	carbon dioxide <i>allow correct formula</i>	1	

glucose
allow sugar / starch

1

(ii) any **two** from:

- light sensitive spot detects light
- tells flagellum to move towards light
- more light = more photosynthesis

2

(d) (cell has) larger SA:volume ratio

1

short (diffusion) distance
allow correct description

1

(diffusion) via cell membrane is sufficient / good enough

or

flow of water maintains concentration gradient

1

[11]

M6.(a) (i) xylem

1

(ii) water

1

minerals / ions / named example(s)
ignore nutrients

1

- (b) (i) movement of (dissolved) sugar
allow additional substances, eg amino acids / correct named sugar (allow sucrose / glucose)
allow nutrients / substances / food molecules if sufficiently qualified
ignore food alone
- 1

- (ii) sugars are made in the leaves
- 1

so they need to be moved to other parts of the plant for respiration / growth / storage

1

- (c) (i) mitochondria
- 1

- (ii) for movement of minerals / ions
Do not accept 'water'
- 1

against their concentration gradient

1

[9]