

Plant Tissues, Organs and Organ Systems

Mark Scheme 1

Level	GCSE (9-1)
Subject	Combined Science: Trilogy - Biology
Exam Board	AQA
Topic	4.2 Organisation
Sub-Topic	Plant Tissues, Organs and Organ Systems
Difficulty Level	Bronze Level
Booklet	Mark Scheme 1

Time Allowed: 55 minutes

Score: /55

Percentage: /100

Grade Boundaries:

M1.(a) cell membrane

extra boxes ticked negates mark

1

(b) nucleus

extra boxes ticked negates mark

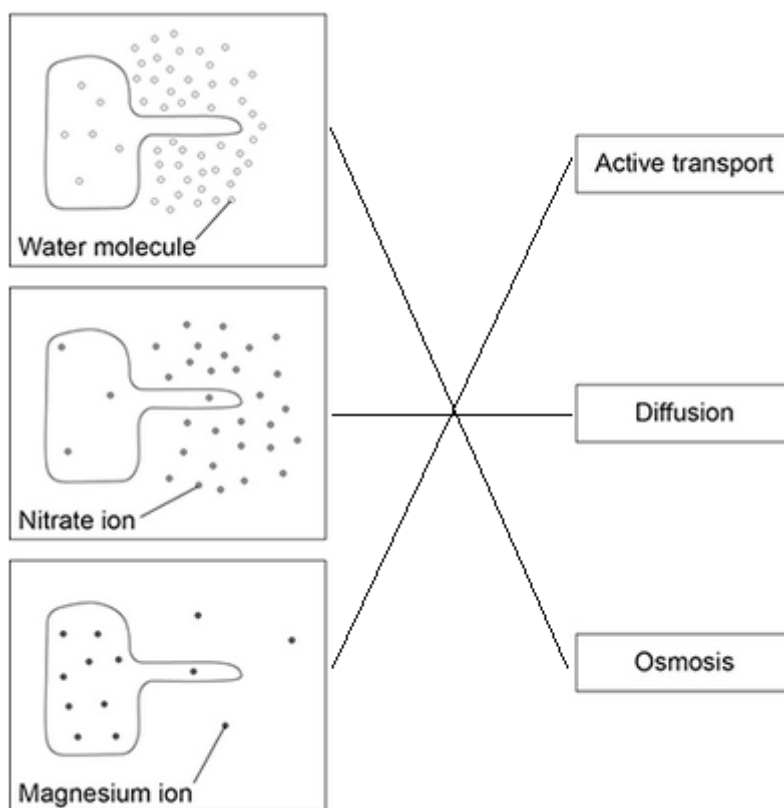
1

(c) has a tail so it can swim (to an egg)

accept has many mitochondria to release energy to swim

1

(d)



*all three correct for 2 marks
one or two correct for 1 mark*

2

[5]

M2.(a)	(i) water / H ₂ O	<i>accept oxygen</i> <i>allow H₂O</i> <i>do not allow H⁺O or H2O</i>	1
	(ii) the mineral ions are absorbed by active transport		1
	the absorption of mineral ions needs energy		1
	(iii) have (many root) <u>hairs</u>		1
	(which) give a large surface area (for absorption)		1
(b) carbon dioxide in or oxygen out or control water loss		<i>accept gas exchange</i> <i>ignore gases in and out</i> <i>ignore gain / lose water</i>	1
(c) (i) guard cells			1
	(ii) (stomata are) closed <i>allow there is no gap / space</i>		1
	(iii) plant will wilt / droop <i>ignore die</i>		1

[9]

M3.(a)	(i)	xylem	1
	(ii)	phloem	1
	(iii)	transpiration	1
	(iv)	stomata	1
(b)	(i)	any one from: <ul style="list-style-type: none">• reduce / prevent evaporation of water from flask• holds plant shoot in place• prevent damage to the plant	1
	(ii)	same surface area or number of leaves <i>(because if they used larger / smaller size shoots) there would be a larger / smaller surface area or a larger/ smaller number of leaves</i> <i>allow same number of stomata</i>	1
		from which (the same amount of) water evaporates <i>(and therefore) more / less water would escape</i> <i>allow from which water escapes</i>	1
	(iii)	4.5 <i>look for answer written in table</i>	1
	(iv)	increasing temperature / heat increases (rate of) water loss / evaporation	1

(v) having moving air / a fan increases (rate of) water loss / evaporation

1

(c) (i) 0.3 g

1

(ii) plastic bag reduces air flow across leaves

or

air is humid around the leaves

allow plastic bag stops water (vapour) leaving

allow air (in plastic bag) becomes saturated (with water)

1

[12]

M4.(a) (i) wind

answers in either order

1

temperature

ignore weather

1

(ii) different plants have different sizes

ignore reference to validity

/ different numbers of leaves

/ different sizes of leaves

/ different plants take up different amounts of water

/ different number of stomata

/ different surface area

allow different plants need different amounts of water

1

(b) in table, in sequence:

C

B

A

all 3 correct = 2 marks
2 correct = 1 mark
0 or 1 correct = 0 marks

max 2

(c) transpiration

1

[6]

M5.(a) xylem and phloem

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

1

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

1

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

1

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

1

[4]

M6.(a) (i) root hairs

if clear which word then allow

1

(ii) xylem

if clear which word then allow

1

(iii) stomata

if clear which word then allow

1

(iv) storage organs

in this order

1

phloem

1

(b) (i) 23.2

1

(ii) loss of water (from flask with plant) from leaves / plant

1

via transpiration / via evaporation

*if no other marks allow used in
photosynthesis for one mark*

1

[8]

M7. (a) transpiration

1

(b) (i) 200

correct answer with or without working

if answer incorrect:

allow 1 mark for 8×25 or

allow 1 mark for answer from candidate's count $\times 25$

2

(ii) **R**

*allow **P** or **Q** if candidate's answer to (b)(i) nearer to value for one of those*

*do **not** allow **R** if the answer to (b)(i) would give an answer of **P** or **Q***

allow R if (b)(i) is blank

1

(iii) *few stomat*

allow no stomata on upper surface / all stomata on lower surface

1

little / less transpiration or little / less water (vapour) loss / enable water to be retained

allow no water loss from upper surface

1

[6]

M8. (a) *transpiration*

1

(b) *increase then decrease*

1

*maximum rate at $36 - 38 (^{\circ}\text{C})$ / $540 - 560$ (grams per day)
any figure in these ranges*

1

- (c) (i) *reduce water loss / prevent wilting*
allow stops water loss

1

- (ii) *40 - 45 °C*

1

[5]