

Mark Scheme

Combined Science GCSE

Plant Structures and Their Functions Test
(Levels 4-9)

	Answer	Marks
1. (a)	• carbon dioxide • oxygen Answer must be given in that order.	(1)
1. (b)	$6\text{CO}_2 + 6\text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$ 1 mark for correct reactants formulae. 1 mark for correct products formulae. 1 mark for correct balancing of equation.	(3)
1. (c)	Photosynthesis	(1)
1. (d)	endothermic	(1)

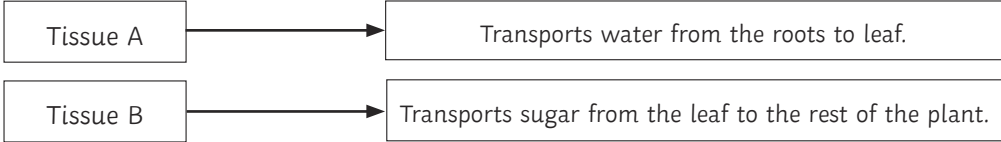
(Total for Question 1 = 6 marks)

	Answer	Marks
2. (a)	• increases the rate of/faster reaction • optimum temperature • if temperature is too high, rate decreases	(2)
2. (b)	graph B	(1)
2. (c)	• increased temperature means more energy • more energy, therefore more reactions • if temperature is too high, enzymes do not work • enzymes denatured • rate of reaction decreases again	(4)

(Total for Question 2 = 7 marks)

	Answer	Marks
3.	• description of apparatus: pondweed in beaker/boiling tube of water, lamp focused on plant and a ruler • leave for given time (3-5 mins) to acclimatise to light • count bubbles given off in 1 minute (or other appropriate given time) • move lamp a given interval (e.g. 10 cm closer/further away) • record results in a table • repeat steps to count bubbles at regular intervals • repeat investigation to improve reliability/calculate average (Maximum 2 marks for description of apparatus.)	(6)

(Total for Question 3 = 6 marks)

	Answer	Marks
4. (a)	root hair cell	(1)
4. (b)	• absorb water from the soil • finger-like shape/elongated membrane • large surface area	(3)
4. (c)	A is a xylem, B is phloem	(1)
4. (d)	 <pre> graph LR A[Tissue A] --> A1[Transports water from the roots to leaf.] B[Tissue B] --> B1[Transports sugar from the leaf to the rest of the plant.] </pre>	(2)

(Total for Question 4 = 7 marks)

	Answer	Marks
5. (a)	Stomata	(1)
5. (b)	to take in carbon dioxide	(1)
5. (c)	translocation	(1)
5. (d)	• water moves against gravity through xylem tubes • water evaporates and diffuses from leaves • water is drawn up the xylem to replace water lost • (xylem) forms a continuous tube/flow of water	(4)
5. (e)	(Light intensity) • bright light increases rate (of transpiration) • stomata open wider • to allow more carbon dioxide/CO₂ for photosynthesis • water vapour diffuses faster (Temperature) • higher temperature increases rate (of transpiration) • evaporation is faster with higher temperature • diffusion is faster with higher temperature • particles have more energy/move faster	(6)
5. (f)	• cuts from broken glassware • scalds or burns from lamp • slips from spilt water	(2)

(Total for Question 5 = 15 marks)

	Answer	Marks												
6. (a)	Independent variable: wind speed Dependent variable: volume of water lost	(2)												
6. (b)	<table><tr><th>Fan Speed Setting</th><th>Mean Average</th></tr><tr><td>1</td><td>4.5</td></tr><tr><td>2</td><td>6.5</td></tr><tr><td>3</td><td>8.0</td></tr><tr><td>4</td><td>11.2</td></tr><tr><td>5</td><td>13.5</td></tr></table>	Fan Speed Setting	Mean Average	1	4.5	2	6.5	3	8.0	4	11.2	5	13.5	(5)
Fan Speed Setting	Mean Average													
1	4.5													
2	6.5													
3	8.0													
4	11.2													
5	13.5													
6. (c)	$13.5 \div 5$ $=2.7$ (Award 1 mark where e.c.f and correct method applied.)	(2)												

(Total for Question 6 = 9 marks)