

QUESTIONSHEET 1

- (a) A - leaf; 1
 B - stem; 1
 C - root; 1
 D - root hairs; 1

- (b) 5

Function of part of plant	Part of plant
Carries water to other plant organs	B;
Makes food using light energy	A;
Anchors plant in ground	C;
Supports the flowers	B;
Absorbs water and mineral salts	D;

- (c) leaf; 1

- (d) absorbs/traps light/sun's energy; 1

TOTAL 11

QUESTIONSHEET 2

- (a) carbon dioxide; 1

- (b) leaves/stomata; 1

- (c) photosynthesis/to make food; 1

- (d) respiration; 1

- (e) A - breathing out/exhalation; 1
 B - breathing in/inhalation; 1

- (f) animals eating plants/consumers eating producers/part of food chain; 1

TOTAL 7

QUESTIONSHEET 3

(a)	(i)	A;	1
	(ii)	B;	1
(b)		B;	1
(c)		oxygen/glucose;	1
(d)	(i)	B;	1
	(ii)	requires light energy;	1
(e)		soil/ground;	1
(f)		food/animals/plants;	1
			TOTAL 8

QUESTIONSHEET 4

(a)		C;	1
		B;	1
		D;	1
		A;	1
(b)	(i)	boiling water makes leaf permeable;	1
	(ii)	alcohol removes chlorophyll from leaf;	1
	(iii)	iodine is used to test for starch;	1
			TOTAL 7

QUESTIONSHEET 5

(a)		to remove starch/destarch leaves;	1
(b)		to exclude light from that part of leaf;	1
(c)		A - yellow/orange/brown;	1
		B - yellow/orange/brown;	1
		C - blue/black/purple;	1
			TOTAL 5

QUESTIONSHEET 6

(a)	to maintain constant temperature/prevent heat affecting plant;	1
(b)	plant photosynthesises; and releases oxygen which causes change in colour of indicator;	1 1
(c)	reduces time for indicator to change colour; from 20 to 12 minutes;	1 1
(d) (i)	1.6/2.0%;	1
(ii)	plant producing oxygen most rapidly; indicator changes colour quickest;	1 1
TOTAL		8

QUESTIONSHEET 7

(a)	five correct plots; (-1 each incorrect plot)	4
(b) (i)	oxygen released increases as temperature increases;	1
(ii)	higher temperatures cause increased rate of reaction;	1
(c)	no oxygen would be released; enzymes denatured by high temperature so photosynthesis stops;	2
(d)	Any two of: light intensity/ light wavelength/ carbon dioxide concentration/ water availability;	2
TOTAL / 10		

QUESTIONSHEET 8

(a)	add hydrogen carbonate to the water;	1
(b) (i)	oxygen;	1
(ii)	it would rekindle a glowing splint;	1
(c)	use heat shield/ container of water;	1
(d)	place the lamp at different distances from the plant; measure volume of oxygen produced at a set time; keep all other conditions consistent/ same wattage bulb/ start with lamp a long distance away and move up for each test;	4
TOTAL		8

QUESTIONSHEET 9

(a)	(i)	C;	1
	(ii)	A;	1
	(iii)	E;	1
(b)		absorbed by roots; carried by xylem tissue; up stem to leaf;	1 1 1
(c)		phloem;	1
			TOTAL 7

QUESTIONSHEET 10

(a)	(i)	carbon dioxide;	1
	(ii)	through the stomata;	1
(b)		oxygen;	1
(c)		leaves contain chloroplasts/chlorophyll; chlorophyll absorbs light;	1 1
(d)		no light at night therefore no photosynthesis; no carbon dioxide absorbed; respiration still occurring; therefore carbon dioxide released;	1 1 1 1
			TOTAL 9

QUESTIONSHEET 11

(a)	A – water/light;	1
	B – light/water;	1
	C - oxygen;	1
(b)	absorbs light energy;	1
(c)	starch;	1
(d)	respiration;	1
		TOTAL 6

QUESTIONSHEET 12

(a)	no starch present in leaves;	1
	plants had been destarched/had used up starch in leaves;	1
(b)	(i) carbon dioxide;	1
	(ii) carbon dioxide;	1
	light;	1
(c)	reduces light reaching plant;	1
(d)	yellow/brown;	1
	no starch present since plant lacking carbon dioxide.	1
TOTAL		8

QUESTIONSHEET 13

(a)	(i) blue;	1
	(ii) plant using up carbon dioxide in photosynthesis;	
	no change in colour of indicator;	1
	(iii) acid;	1
	(iv) colour of tube 5 - green;	1
	snail gives off carbon dioxide;	1
	as a result of respiration;	1
	plant in dark and does not photosynthesise;	1
	and use up carbon dioxide;	1
	pH of tube 5 - acid;	1
	carbon dioxide dissolves in pond water to form acid;	1
	which causes indicator to change colour;	1
(b)	(i) 2, 4;	1
	(ii) 2, 3, 4 and 5;	1
TOTAL		13

QUESTIONSHEET 14

(a)	6 correct plots;;; (-1 mark each incorrect plot)	6
(b)	(i) 2 pm;	1
	(ii) high light levels at 2 pm; plant photosynthesising rapidly; and producing sugar;	1 1 1
(c)	no light available for photosynthesis; no sugar manufactured; sugar in leaves used in respiration; or converted to starch and stored;	1 1 1 1
(d)	between 1.1 and 1.2%;	1
TOTAL		12

QUESTIONSHEET 15

(a)	50 (arbitrary units);	1
(b)	30 (arbitrary units);	1
(c)	as light intensity increases, rate of photosynthesis increases; up to a light intensity of 30 arbitrary units and then remains constant;	1 1
(d)	one of: temperature; availability of water;	1 1
(e)	(i) increasing carbon dioxide levels increases the rate of photosynthesis; which gives increases yield of tomatoes/faster growth of tomatoes;	1 1
	(ii) rate of photosynthesis remains the same above a light intensity of 40 arbitrary units; therefore increased light above this level would have no effect on growth of tomatoes;	1 1
TOTAL		9

QUESTIONSHEET 16

(a)	production of cell walls;	1
(b)	to form protein; for growth/production of new tissues;	1 1
(c)	(i) nitrates;	1
	(ii) absorbed by roots; in solution/dissolved in water;	1 1
(d)	starch is insoluble; does not cause water to accumulate in cells; as a result of osmosis;	1 1 1
TOTAL		9

QUESTIONSHEET 17

(a)	provides oxygen; for respiration of roots;	1 1
(b)	prevents algal growth; which would use up some of minerals;	1 1
(c)	measure increase in height/number of new leaves;	1
(d)	(i) stunted/reduced growth; yellow leaves;	1 1
	(ii) yellow leaves; leaves with dead spots;	1 1
	(iii) reduced/poor root growth; purple younger leaves;	1 1
TOTAL		11

QUESTIONSHEET 18

- (a) carbon dioxide is increasing;
plant can absorb more carbon dioxide;
carbon dioxide is one of the reactants/ substrates in photosynthesis;
rate of reaction is speeded up/ not limited by carbon dioxide; **4**
- (b) other factors affect photosynthesis;
such as temperature/ light intensity;
one of these is a limiting factor between B and C; **2**
- (c) (i) more carbon dioxide results in more/ faster rate of photosynthesis;
leading to greater/ faster growth crops/ increased yields of plant foods; **2**
- (ii) carbon dioxide forms acid rain;
acid rain damages crops/ slow growth in crops; **2**
- TOTAL 10**

QUESTIONSHEET 19

- (a) (i) produce more amino acids/proteins;
leading to faster/greater growth/increased yield; **2**
- (ii) arid/dry soils could be planted with cereal crops;
plants would be able to grow during drought;
yields increased/food produced where there was none before; **3**
- (b) 1 of:
may affect human metabolism/health;
insecticide resistance in plants may kill useful insects;
transfer of insecticide residue into weeds; **1**
- TOTAL 6**

QUESTIONSHEET 20

- (a) placed in darkness for 24 / 48 hours;
so all starch carried away from leaf/ used in respiration;
thus no starch present to begin with which would obscure the results/
any starch found in experiment must have been made during the experiment; 3
- (b) so that the level of carbon dioxide present is not limiting;
since carbon dioxide is a factor used in photosynthesis; 2
- (c) A. all conditions for photosynthesis are present;
thus no starch will be made; 2
- B. no light is present;
thus no starch is made; 2
- C. all conditions for photosynthesis are present;
thus starch can be made/ref also made from glucose in solution; 2
- D. no light is present so photosynthesis cannot take place;
but leaves can make starch from the glucose supplied in the dark; 2

TOTAL 13