



Question number	Answer	Notes	Marks
1 (a)	$6\text{CO}_2 + 6\text{H}_2\text{O} \longrightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$;;	unbalanced but correct = 1 eg $\text{CO}_2 + \text{H}_2\text{O} \longrightarrow \text{C}_6\text{H}_{12}\text{O}_6 + \text{O}_2$; words alone = 0	2
(b) (i)	1. turn off Bunsen / use water bath / eq; 2. ethanol is flammable / eq; OR 3. wear goggles; 4. protect eye; OR 5. use forceps / tongs; 6. protect fingers / skin;	ignore gloves / protective clothing	2
(ii)	kill leaf / stop digestion / stop chemical reactions; denature enzymes;	ignore wax removal / soften leaf	1
(iii)	1. remove chlorophyll / remove green (pigment) / remove colour / to see colour of iodine; 2. allow remove waxy cuticle;	ignore remove chloroplasts / destroy chlorophyll	1



(c)(i)	1. place one leaf in light / no cover of leaf; 2. place one leaf in dark / cover part of leaf;	2. use of stencil / tape	2
(ii)	1. use variegated leaf / eq; 2. draw pattern of chlorophyll and compare results / test white and green parts / eq;		2
(iii)	1. NaOH / soda lime / KOH; 2. absorb / remove carbon dioxide / eq;		2

Total 12 marks



Question number	Answer	Notes	Marks
2	large surface area; thin (leaf); upper epidermis / cuticle; transparent / lets light through; chloroplasts / chlorophyll; palisade (mesophyll); close to surface; absorb <u>light</u> ; spongy (mesophyll); diffusion; stomata / guard cells; carbon dioxide; xylem; water; ignore if transpired	mark points independently allow carbon dioxide and water if given in an equation	max 6

TOTAL 6 MARKS



Question number	Answer	Notes	Marks
3 (a) (i)	named ion; eg. nitrate / magnesium / phosphate / sulphate / iron / potassium / calcium use of ion;	eg. nitrate for amino acids / protein / nucleic acid / eq allow Mg and chloroplast allow symbols ignore nitrogen / copper	2
(b) (i)	S – scale linear and half grid in one direction; L – line straight and through points; A1 – axes correct way round; A2 – axes labelled (days and number/leaves); P – points plotted accurately; K – key;	if leaves plot as zero for day 0 lose P but allow L if leaves plot as 10 for day 0 allow P and L	6
(ii)	light; temperature; carbon dioxide; pH; humidity; ignore water wind;	ignore ref to plant	max 3

TOTAL 11 MARKS

Question number	Answer	Notes	Marks
4 (a)	$6\text{CO}_2 + 6\text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$; ; $\text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + \text{O}_2 = 1$	<p>correct formula equation for photosynthesis = 1</p> <p>if this formula equation is correctly balanced = 2</p> <p>accept CO₂ reject CO²</p> <p>word equation = 0 respiration = 0</p>	2

(b)	(i)	<p>Two from:</p> <ol style="list-style-type: none"> 1. mperature 2. light (intensit 3. carbon dioxide / CO₂; <p>Then:</p> <ol style="list-style-type: none"> 4. indication of level of abiotic factor during the day; 5. stated effect on rate of photosynthesis; 	Max 4
	(ii)	<ol style="list-style-type: none"> 1. ss <u>photosynthesis</u>; 2. (more) transpiration / evaporation / loss of water / eq; 3. wilti / loss of turgor / stomata close / less mineral ion transport; 4. less carbon dioxide uptake; 5. enzymes denature / change in shape of active site / eq; 	<ol style="list-style-type: none"> 1. gnore less respiration 4. gnore gas exchange <p>Max 4</p>

Question number	Answer	Notes	Marks
5(a)	1. scale linear for numbers on y axis and uses half grid; 2. x axis labelled year(s) or 1969-73; 3. y axis labelled number of heart attacks; 4. units as per 100 000; 5. plotted correctly; 6. y for men and women;	Line graph lose 1 for plotting Allow Mps 1, 2 and 3 if plotted horizontally	6
(b)	men higher / women lower / eq; men decreased / little change in women / women increased in recent years / women fluctuate / eq;		2
(c)	less smoking / less fat in diet / less alcohol / less salt / more exercise / eq;	Ignore better healthcare / medicine / education / alone Ignore stress eat more healthily = 0 Allow more aware of effects of smoking	1

(d)	<ol style="list-style-type: none">1. ss oxygen;2. ss (aerobic) respiration;3. <u>anaerob</u> respiration;4. ctic acid / low pH;5. enzy s denatured;	Ignore glucose	max 3
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Total 12 marks