

Chapter 5 – Biological processes

Question	Answers	Extra information	Mark
1	veins – transport water to the leaf cells stomata – allow carbon dioxide into the leaf waxy layer – reduces the amount of water loss guard cells – open and close the stomata	2 marks for two correctly matched 1 mark for one correctly matched	3
2(a)	soil dissolve root hair vessels		1 1 1 1
(b)	nitrate/phosphate/magnesium		1
(c)	fertiliser/manure		1
3(a)	photosynthesis		1
(b)	chloroplast		1
(c)	carbon dioxide glucose		1 1
4(a)	glucose		1
(b)	cause cramps/muscle fatigue		1
(c)	beer/bread/wine/yoghurt/cheese	Accept any other food or drink product produced by fermentation	1
5(a)	glucose + oxygen → carbon dioxide + water	Accept reactants in any order and products in any order 1 mark for one correct reactant and one correct product	2
(b)	mitochondria		1

Question	Answers	Extra information	Mark
(c)	diffuses into plasma/blood transported to lungs exhaled/breathed out/diffuses out of the alveoli		1 1 1
6(a)	carbon dioxide/light/chlorophyll		1
(b)	water diffuses into the root/root hair cells transported through the plant in the water vessels diffuses into the leaf cells		1 1 1
(c)	Any two from: <ul style="list-style-type: none"> • open during the day • to allow carbon dioxide to diffuse into the leaf • to allow oxygen to diffuse out of the leaf 		2
7(a)	oxygen		1
(b)	Any two from: <ul style="list-style-type: none"> • light is needed for photosynthesis • the closer the plant is to the windowsill/the greater the light intensity, the more oxygen is produced • oxygen is produced as a result of photosynthesis 		2

Question	Answers	Extra information	Mark
8	<p>Examples of correct scientific points:</p> <p>Similarities:</p> <ul style="list-style-type: none"> • both transfer energy to the cell • use glucose as a reactant <p>Differences:</p> <ul style="list-style-type: none"> • aerobic respiration uses oxygen • anaerobic respiration does not use oxygen • aerobic respiration produces carbon dioxide and water • anaerobic respiration produces lactic acid • aerobic respiration transfers more energy per glucose molecule • humans can only respire anaerobically for short periods of time 	For full marks, at least one similarity must be stated	6
9(a)	<p>Any four from:</p> <ul style="list-style-type: none"> • boil leaf • place leaf in (warm) ethanol • wash the leaf • add iodine • iodine turns blue–black if starch present 		4
(b)	<p>leaf A shows that plants need sunlight for photosynthesis, as starch is only produced in the uncovered parts of the leaves</p> <p>leaves B and C show that carbon dioxide is needed for photosynthesis as starch is only produced when carbon dioxide is present in leaf C</p>		1 1 1 1
(c)i	centre of leaf shaded in with a white border		1
(c)ii	<p>chlorophyll is needed for photosynthesis</p> <p>it absorbs the light from the Sun</p>		1 1
	SPACED LEARNING QUESTIONS		
10(a)	germination		1

Question	Answers	Extra information	Mark
(b)	[C] → D → B → F → A → [E]	1 mark for each step in the correct order	4
11(a)	For example: nervous system – transmits impulses around the body/reproductive system – produces new offspring	1 mark for organ system 1 mark for its linked function	2
(b)	Any four from: <ul style="list-style-type: none">• cells are the smallest units• similar cells work together to make tissues• tissues work together to form organs• organs work together to form organ systems• organ systems work together to form an organism		4