



General Certificate of Secondary Education
2017–2018

Double Award Science: Biology

Unit B1

Higher Tier

[GSD12]

WEDNESDAY 8 NOVEMBER 2017, MORNING

**MARK
SCHEME**

General Marking Instructions

Introduction

Mark schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

The Purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of students in schools and colleges.

The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

			AVAILABLE MARKS			
1	(a)	A shoot straight; ignore height and foil	[3]			
		B shoot straight; ignore height – no mark if tip drawn on				
		C shoot bent towards light				
1	(b)	Any three from: auxin; produced in tip/found in tip; moves to shaded side/on shaded side/LHS/dark side; causes cells to elongate/cells get longer/differential growth; tip bends to light/grows towards light	[3]	7		
		(c) phototropism/tropism	[1]			
2	(a)	(i) amino acids	[1]			
		(ii) stomach; small intestine/ileum/duodenum/villi	[2]			
	(b)	(i) no protease enzyme present in 2/no protease in 2/protease only in 1/only milk in 2	[1]			
		(ii) timer/stop clock	[1]			
		(iii) amount of milk/substrate/type of milk/amount of protease/ concentration of protease/enzyme concentration	[2]			
		(iv) colourless/decolourised/clear	[1]			
		(v) 40 °C	[1]			
		(vi) carry out at more temperatures/wider or bigger range; use digital thermometer/temp probe; between 30–50 (identify a range around 40°C)/ smaller temperature intervals } [2] from these statements go up in 5°C intervals	[2]			
		(c)	Any three from: 'lock and key'; enzyme denatured; structure of enzyme changed/no ES complex formed/E and S not complementary/active site changes shape/E and S don't fit/substrate can't fit active site; protein will not be broken down		[3]	13

- 3 (a) insulin increases – due to increase in blood glucose
or have eaten breakfast; [2]
insulin decreases – due to decrease in blood glucose

(b) **Indicative content**

insulin produced by pancreas;
travels in the bloodstream;
acts in liver;
glucose converted/stored/turned into glycogen;
glucose converted/stored/turned into fat;
more respiration (of glucose);
more uptake of glucose;
which lowers blood glucose/sugar/returns blood glucose to normal (if said
blood glucose high elsewhere in answer)

Response	Marks
Candidates use appropriate terms throughout to give at least five points about the action of insulin. They use good spelling, punctuation and grammar skills. Form and style are of a high standard.	[5]–[6]
Candidates use appropriate terms throughout to give at least three or four points on insulin from the indicative content. They use satisfactory spelling, punctuation and grammar. Form and style are of a satisfactory standard.	[3]–[4]
Candidates use appropriate terms throughout to give one or two points on insulin from the indicative content. They use limited spelling, punctuation and grammar and have made little use of specialist terms.	[1]–[2]
Response not worthy of credit.	[0]

[6]

8

- 4 (a) (i) spiral wrack; [1]

(ii) Spiral wrack decreased to 700 g;
Bladder wrack decreased to 630 g;
Serrated wrack decreased to 560 g; } Any 2 from

or

Spiral wrack decreased by 300 g;
Bladder wrack decreased by 370 g;
Serrated wrack decreased by 440 g; } Any 2 from

or

Spiral wrack decreased 70 g **less** than bladder wrack/140 g **less** than serrated wrack; [2]

(iii) Any **two** from:

- found on upper shore/high up shore/furthest from sea/top of shore;
- covered by water for only short time/where shore is drier/gets least H₂O/waits longest till sea comes back;
- most exposed to sun/wind [2]

			AVAILABLE MARKS	
	(b)	<ul style="list-style-type: none"> • found on lower shore/closest to sea; • covered by water most of the time/least likely to dry out; gets lots of water during the day/more likely to be covered by waves ignore mucus refs	[2]	7
5	(a) (i)	oil/paraffin	[1]	
	(ii)	stops oxygen entering/maintains anaerobic conditions	[1]	
	(b)	glucose/sugar	[1]	
	(c)	Any two from: more yeast; cloudy; less sugar/glucose; alcohol present/ethanol present; CO ₂ /bubbles; increase in temperature	[2]	
	(d) (i)	red to yellow (need both)	[1]	
	(ii)	carbon dioxide/CO ₂	[1]	7
6		thin walls/one cell thick/thin cells; short diffusion distance/faster or more absorption/faster or more diffusion; dense network of capillaries/lot of capillaries/good blood supply; maintain concentration gradient (for diffusion) /carry away molecules quickly/large diffusion gradient/faster rate of diffusion/absorption/more diffusion or absorption; presence of lacteal; allows absorption of digested or broken down fats/digested lipids/fatty acids or glycerol; microvilli; further increases surface area; any two set – feature needs to be matched with explanation for 2nd mark in both cases	[4]	4
7	(a)	160 (40 + 120); 100 × 160; (100 × 160)/40 = 2 marks = 400	[3]	
	(b) (i)	shading/mineral depletion/can't get enough light for photosynthesis/nitrate depletion/run out of fertiliser/run out of nitrate	[1]	
	(ii)	bacteria/fungi/decomposers	[1]	
	(iii)	decomposers/bacteria/fungi use up the oxygen/in respiration; fish suffocate/not enough oxygen for the fish/fish can't breathe	[2]	

		AVAILABLE MARKS
	(c) Any two from: predators/named predator/eat each other; lack of food; lake dries up; disease; angling/fishing/overfishing	[2] 9
8	(a) less or decreased ammonia/ammonium; less/decrease for nitrifying bacteria/less nitrification	[2]
	(b) (i) denitrifying	[1]
	(ii) turns nitrate into nitrogen (gas)	[1]
	(c) amino acids/protein	[1]
	(d) Any two from: hairs trap insects/easier to catch prey/insects stick to leaves; enzymes breakdown insects/breakdown protein/release amino acids; enzymes allow release of minerals/release nutrients/speed up digestion enzymes release products of digestion	[2] 7
9	(a) decrease in mass/get lighter/mass in step 1 greater or more (ignore if compare to step 2, i.e. can still award mark)	[1]
	no photosynthesis: respiration occurs; destarched/respiration uses up starch/food/glucose (respiration only = [2])	[3]
	(b) increase in mass/bigger/heavier/mass in step 1 smaller	[1]
	photosynthesis occurs; starch/glucose produced; photosynthesis greater than respiration = [2]	[3] 8
Total		70