Rewarding Learning

General Certificate of Secondary Education
2013–2014

Double Award Science: Biology

Unit B1

Higher Tier

[GSD12]

TUESDAY 13 MAY 2014, 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)	(i)	177 – 117 = **60**	[1]	
		(ii)	60/117; (× 100) = 51.28%/51.3%/51%	[2]	
	(b)		highest rate of photosynthesis/maximum yield/ as **both light and carbon dioxide** were increased	[2]	
	(c)		temperature/water/minerals/named mineral/soil pH	[1]	
	(d)		cost of increased CO_2 /cost of lighting/cost of other named factor	[1]	7
2	(a)		(all) different/types of living organisms/types of animals and plants/ variety of living organisms/number of species	[1]	
	(b)		temperature	[1]	
	(c)	(i)	plankton → (corals) → starfish → triton (in correct places); arrows correct	[2]	
		(ii)	 1 shape and symmetrical + largest bar at bottom; 1 plankton at bottom + largest; 1 coral, starfish and triton/fish in correct order	[3]	
	(d)	(i)	no photosynthesis/algae die; less O_2 **dissolved** in water; reduced sugar or oxygen so cannot make skeletons/cannot grow/ cannot respire	[2]	
		(ii)	species diversity/livelihood for people/fishing/protects land/ conservation/recreation/tourism/habitat for organisms/ as a food source/biodiversity/prevents extinction	[1]	
		(iii)	(water) pollution/sewage/silage/fertiliser/fishing/boats/industrial waste/ oil/divers/tourists/coral being collected/fishing/eutrophication	[1]	
		(iv)	indicator	[1]	
	(e)	(i)	temperature probe/thermometer	[1]	
		(ii)	increase reliability/obtain average	[1]	14

AVAILABLE MARKS

3 **(a)** **(i)** Any two from:
so that molecules are soluble;
so that the molecules are small;
to be absorbed (into the blood)/pass **into blood** [2]

(ii) protease
amino acids [2]

(iii) Any two from
- long;
- large surface area;
- villi/folds/microvilli;
- thin (epithelial layer);
- good blood supply/**lots** of capillaries;
- lacteal;
- permeable [2]

(b) **Indicative content**
- carry out with both (each) tissues/carry out with potato and liver;
- count bubbles/collect gas/measure foam or described/volume of gas;
- in a given time;
- repeat for reliability/to get averages;
- same weight/mass/amount of tissue in each/add same volume of H_2O_2/ same pH/same temperature/same concentration of H_2O_2;
- wear goggles/wear gloves [6]

Response	**Marks**
Candidates use appropriate terms throughout to give at least three points about how to carry out the experiment giving one variable to be controlled and one safety point about how to carry out the experiment. They use good spelling, punctation and grammar. Form and style are of a high standard.	5–6
Candidates use appropriate terms throughout to give at least three or four points from the indicative content. They use satisfactory spelling, punctation and grammar. Form and style are of a satisfactory standard.	3–4
Candidates use appropriate terms throughout to give one or two points 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

(c) **(i)** breaking down/split apart;
building up/described [2]

(ii) produces two different **types** of products (fatty acid, glycerol) [1]

(iii) lock and key [1]

16

					AVAILABLE MARKS
4	(a)	(i)	in the blood; gland/muscle/effector to the brain/spinal cord/CNS; to target organ; fast **and** slow (need both)	[4]	
	(b)	(i)	auxin;	[1]	
		(ii)	phototropism;	[1]	
		(iii)	**more** photosynthesis	[1]	7
5	(a)		more O_2 in beaker C; for more energy/respiration; for active transport/moving minerals against conc gradient	[3]	
	(b)		• mineral uptake steady/plateau; • cannot absorb any more minerals/some other factor limiting (or named)/ O_2 is **not** the limiting factor/no more minerals left to absorb	[2]	5
6	(a)		**oxygen** present/available	[1]	
	(b)		**more** energy	[1]	
	(c)		red to yellow	[1]	
	(d)		Any two from: • less glucose; • bubbles of CO_2 produced; • alcohol produced; • **(**more) cloudy/**more** yeast; • increased temperature.	[2]	
	(e)		Any two from: boil solution; cool before adding yeast; add layer of oil	[2]	7
7	(a)		use gloves/safety on river bank	[1]	
	(b)	(i)	clean water at A/no nitrates/no pollution at A; nitrates entered before B/**high** concentration nitrates/pollution; nitrates diluted/used up by C/lower concentration nitrates/ **less** pollution	[3]	
		(ii)	• 400mg//a lot of oxygen used up; Any two: • algal blooms/plants grow/eutrophication; • algae die/plants die; • decomposed (by micro-organisms)/decayed	[3]	
	(c)		one reinforces the other/more sure of result	[1]	8

8 Indicative content

- some receptor molecules have different shape/less receptor molecules/ wrong shape;
- less insulin attaches/insulin won't fit/won't work;
- **less** glucose converted to glycogen;
- **less** glucose respired;

- less insulin needed/receptor molecules may be enough to regulate glucose;
- 2 health implications – eye damage/kidney failure/CHD/strokes

Response	Marks
Candidates use appropriate terms throughout to describe and explain at least 3/4 points about how a diabetic's liver is different and give at least 1/2 points about why the 65 year old man is advised to lower his glucose intake. They use good spelling, punctation and grammar. Form and style are of a high standard.	5–6
Candidates use appropriate terms throughout to describe and explain at least 1/2 points about how a diabetic's liver is different and give at least 1/2 points about why the 65 year old man is advised to lower his glucose intake. They use satisfactory spelling, punctation and grammar. Form and style are of a satisfactory standard.	3–4
Candidates use appropriate terms throughout to describe and explain at least 1/2 points about how a diabetic's liver is different or why the 65 year old man is advised to lower his glucose intake. They use limited spelling, punctuation and grammar and have made little use of specialist terms.	1–2
Response not worthy of credit.	0

[6] 6

Total **70**

AVAILABLE MARKS