Rewarding Learning

General Certificate of Secondary Education
2013–2014

Double Award Science: Biology

Unit B1

Higher Tier

[GSD12]

MONDAY 24 FEBRUARY 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)** auxin [1]	
	(b) arrow starting in shoot tip and to left [1]	
	(c) tip bent towards the light [1]	
	(d) more auxin causes cell elongation on left side [1]	
	(e) more light for photosynthesis [1]	5

2 **(a)** **(i)** 1 for enzyme
1 for substrate
1 for product molecule [3]

(ii) lock and key [1]

(iii) broken down [1]

(iv) different shape (at active site) [1]

(b) **(i)** Graph 1 – temperature
Graph 2 – pH
Graph 3 – enzyme concentration
All three correct – 2 marks one correct – 1 mark [2]

(ii) protein [1]

(iii) small intestine/ileum/pancreas [1]

(c) Indicative content

- villi give a large surface area;
- villi have a good blood supply/capillary presence;
- cows with disease have no villi;
- less surface area in these cows' intestines;
- less absorption of food in these cows' intestines;
- cows with the disease starve/malnutrition/use up stores of energy or glycogen;
- presence of microvilli;
- wall is one cell thick/thin wall;
- permeable;
- lacteals.

For 5 or 6 marks (top band) must have one reference to cows

Response	Mark
Candidates use appropriate terms throughout to describe at least 5 or 6 points from the indicative content. At least 1 point must be about the cows. They use good spelling, punctuation and grammar. Form and style are of a high standard.	[5–6]
Candidates use appropriate terms throughout to describe at least 3 or 4 points from the indicative content. They use satisfactory spelling, punctuation and grammar. Form and style are of a satisfactory standard.	[3–4]
Candidates describe 1 or 2 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]

[6] 16

AVAILABLE MARKS

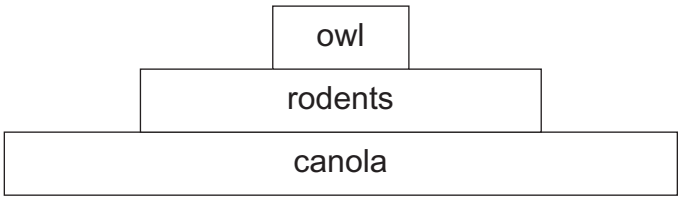
3 **(a)** Any two from:
- sensitive hearing; to hear prey or faint sounds;
- silent flight; so prey do not hear predator/owl;
- talons; for grasping/carrying prey/killing prey;
- turn head; to see prey. [4]

(b) cannot hear rodents/prey or prey stay hidden [1]

(c) 1. so that nesting sites/living areas are available/habitat;
2. birds not poisoned;
3. easier to hunt rodents/more rodents caught/help owls find food. [3]

(d) **(i)** canola → rodent → owl [2]

(ii)



1 for shape of pyramid with 3 levels and symmetrical with largest at base;
1 for labels in correct order from bottom to top [2] 12

					AVAILABLE MARKS
4	(a)	(i)	ammonia/ammonium/ammonium compounds	[1]	
		(ii)	top left – denitrifying (bacteria); top right – nitrogen-fixing (bacteria); bottom left – nitrifying (bacteria)	[3]	
	(b)	(i)	active transport/active uptake	[1]	
		(ii)	**root hair** cells;	[1]	
		(iii)	extension/long shape; large surface area	[2]	8
5	(a)	(i)	brain and spinal cord	[1]	
		(ii)	effector/muscles	[1]	
	(b)	(i)	as diameter decreases, speed decreases	[1]	
		(ii)	A − 40 m/s, B − 64 m/s; Difference = 24 arbitrary units	[2]	
	(c)		hormones slower/nerves faster	[1]	6
6	(a)		less biodiversity at A or more biodiversity at B	[1]	
	(b)		indicator	[1]	
	(c)		advantage – less equipment needed/quicker/cheaper/gives indication over time/can be carried out in the field	[1]	
	(d)		Any four from: eutrophication occurs; more algal growth/algal bloom; shading effect; algae die/decompose; decomposition is by bacteria; **bacteria** use up oxygen/decomposers use up oxygen.	[4]	
	(e)		• absorbed by plants/algae/used by plants; • dilution; • presence of denitrifying bacteria.	[2]	
	(f)		sewage/silage/fertiliser/milk/farmyard manure/effluent	[1]	10

AVAILABLE MARKS

7 **(a)** Indicative content

- oil – stops oxygen **entering**/maintains anaerobic conditions
- solution boiled to kill any other microorganisms/sterilise
- solution boiled to remove oxygen
- solution cooled – otherwise would kill yeast
- indicator turns yellow
- because carbon dioxide produced
- glucose is there so yeast can respire/as substrate for yeast

Response	**Mark**
Candidates use appropriate terms throughout to describe or explain at least 5 of the above points. They use good spelling, punctuation and grammar skills. Form and style are of a high standard.	[5–6]
Candidates use appropriate terms throughout to describe or explain 3 or 4 of the above points. They use satisfactory spelling, punctuation and grammar. Form and style are of a satisfactory standard.	[3–4]
Candidates use appropriate terms throughout to describe or explain 1 or 2 of the above points. They use limited spelling, punctuation and grammar and have made little use of specialist terms.	[1–2]
Response not worthy of credit.	[0]

[6]

(b) Glucose; lactic (lactate) acid + energy [2] 8

8 **(a)** **(i)** With increasing temperature, respiration increases [1]

(ii) 2.0 + 2.4;
= 4.4 [2]

(b) 20 °C;
most uptake of carbon dioxide/most photosynthesis [2] 5

Total **70**