Rewarding Learning

General Certificate of Secondary Education
2017–2018

Science: Single Award

Unit 1 (Biology)

Higher Tier

[GSS12]

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)	(i)	A [1] B [1]	[2]	
		(ii)	Reading/eating/walking or any other suitable answer	[1]	
		(iii)	Any **two** from: • reflex action is faster than voluntary • reflex action has shorter pathway • reflex action does not involve conscious thought	[2]	
		(iv)	Protection	[1]	
	(b)	(i)	Pancreas	[1]	
		(ii)	Lowers blood glucose levels [1] turns glucose into glycogen [1] in the liver [1]	[3]	
	(c)		A – glucose level varies dramatically/has a large fluctuation	[1]	11
2	(a)	(i)	Rhododendron/other appropriate response	[1]	
		(ii)	The greys carry a virus that kills the red squirrels [1] The greys out-compete the reds for food [1]	[2]	
	(b)		Number of reds increase [1] because pine martens are killing the greys on the ground [1] therefore reds don't get the virus/reds have enough food [1]	[3]	6

AVAILABLE MARKS

3 **(a)** **(i)** Flu is caused by a virus/John has a virus [1]
which will not be destroyed by antibiotics [1] [2]

(ii) Antibiotic resistance [1]
bacteria have mutated/due to overuse/not taking the full course [1] [2]

(b) **Indicative content**

- in the lab/on cells or tissues
- if the drug works
- animal testing
- on whole body systems before giving to humans
- clinical trials
- drugs given to humans
- to find out any side effects/dosage

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe and explain the stages of drug development using **6 or 7** points, in a logical sequence. They use good spelling, punctuation and grammar and the form and style are of a high standard.	[5]–[6]
B	Candidates must use appropriate specialist terms throughout to describe and explain the stages of drug development using **4 or 5** points, in a logical sequence. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	[3]–[4]
C	Candidates describe and explain drug development using **1, 2 or 3** points, however these are not presented in a logical sequence. They use limited spelling, punctuation and grammar and the form and style are of a limited standard.	[1]–[2]
D	Response not worthy of credit.	[0]

[6] 10

					AVAILABLE MARKS
4	(a)	(i)	IN: Carbon Dioxide OUT: Oxygen	[2]	
		(ii)	Photosynthesis	[1]	
		(iii)	Gets slower	[1]	
	(b)	(i)	Phototropism	[1]	
		(ii)	Hormones [1] cause increased growth on the dark side [1]	[2]	
		(iii)	Turn the plant so the other side faces the light/rotate plant/place light above plant	[1]	8
5	(a)		Carbon dioxide/sulfur dioxide	[1]	
	(b)	(i)	Living	[1]	
		(ii)	Sample the number of lichen plants in the town before/in another town without the policy [1] (Introduce the policy) sample the number present (every month) [1] if the number of lichens has increased then the air is now cleaner [1]	[3]	
	(c)		Any **two** from: • don't allow slurry to be spread too close to a river • don't spread slurry on a windy/wet day • only spread on certain times of the year • test the soil and add what's needed	[2]	
	(d)		Any **three** from: • sewage is rich in nitrogen-containing compounds • decomposition/decay • to ammonia • ammonia is converted into nitrates • by nitrifying bacteria	[3]	10
6	(a)	(i)	2 mins	[1]	
		(ii)	4 mins	[1]	
	(b)	(i)	All points plotted correctly [2] 5 points plotted correctly [1] line joining points [1]	[3]	
		(ii)	Any **two** from: • at rest Mary's HR is higher • Mary's HR increases more during exercise/increases at a faster rate • Mary's HR takes longer to return to resting rate/didn't return to resting rate in time shown	[2]	
	(c)		Type 2 diabetes/high bp/CHD	[1]	8

AVAILABLE MARKS

7 **(a)** **(i)** A condition passed down the generations/passed down from parents to children [1]

(ii)

	A	a
A	AA	Aa
a	Aa	aa

Gametes correct [1]
Offspring correct [1] [2]

(iii) aa [1]

(b) **(i)** There is only a chance of the baby having sickle cell anaemia if both parents are carriers/if the mother is not a carrier then the baby cannot have the condition. [1]

(ii) To be able to prepare and educate themselves about the condition if the baby is a sufferer [1]
may decide against having a baby. [1] [2]

(c) Not insure the person **or** higher premium [1]

Any **two** from:
- need more medical care
- more likely to claim/cost the companies more
- shorter life span [3]

10

AVAILABLE MARKS

8 **(a)** It consists of 2 strands/double helix [1]
joined by base (pairs) [1] [2]

(b) Thymine and cytosine/T and C [1]

(c) **(i)** Amino acid [1]

(ii) Base Triplet (Hypothesis) [1]

(iii) Protein [1]

(d) **Indicative content**

- Chargaff
- comparative mass of bases
- Franklin & Wilkins
- X-ray diffraction/Crystallography
- to show the shape of DNA
- Watson & Crick
- modelling
- to discover the double helix structure/A join with T and C with G

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe the scientists and their work using **6 to 8** of the points above, in a logical sequence. They use good spelling, punctuation and grammar. The form and style are of a high standard.	[5]–[6]
B	Candidates must use appropriate specialist terms throughout to describe the scientists and their work using **4 or 5** of the points above, in a logical sequence. They use satisfactory spelling, punctuation and grammar. The form and style are of a satisfactory standard.	[3]–[4]
C	Candidates describe the scientists and their work using **1, 2 or 3** of the points above. These are not represented in a logical sequence. They use limited spelling, punctuation and grammar. The form and style are of a limited standard.	[1]–[2]
D	Response not worthy of credit.	[0]

[6] 12

Total **75**