Rewarding Learning

General Certificate of Secondary Education
2014–2015

Double Award Science: Biology

Unit B1

Foundation Tier

[GSD11]

WEDNESDAY 12 NOVEMBER 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)** Two arrows, pointing to RHS [1]

(ii) Grass [1]

(iii) Sun/light [1]

(iv) Increase [1]

(b) (If food source runs out) animals will die or starve/population decrease; population extinct/species dies out/no population left [2]

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2 **(a)** A = Lime
B = Horse Chestnut
C = Alder
D = Rowan
All four correct = 3 marks
Two or three correct = 2 marks
One correct = 1 mark [3]

(b) **(i)** So no starch present/to destarch plant [1]

(ii) To block out light/to stop photosynthesis/no photosynthesis [1]

(iii) All of leaf X shaded; Leaf Y section covered by card unshaded and two ends of leaf Y shaded [2]

(c) **(i)**

water H_2O + **carbon dioxide** CO_2 $\xrightarrow[\text{chlorophyll}]{\text{sunlight}}$ glucose + **oxygen** O_2

[3]

(ii) Any **two** from:
Starch;
Cellulose/cellwall;
Respiration/energy/active uptake;
Proteins;
Oils/lipids/fats
Reproduction/seeds;
Growth;
Also chlorophyll [2]

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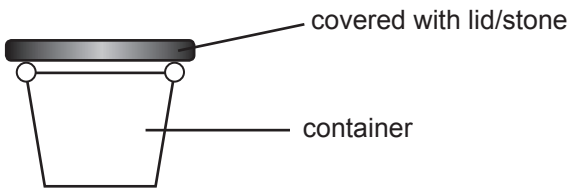
				AVAILABLE MARKS
3	(a)	A = Photosynthesis B = Combustion/burning C = Eating/ingestion/consumption/feeding	[3]	
	(b) (i)	Release energy/produce energy/make energy	[1]	
	(ii)	Glucose; Oxygen	[2]	
	(c) (i)	Polar ice caps melt/glaciers melting/icebergs/water expands; Sea levels rise/ocean levels rise; Islands are low-lying/only 2.4 metres above sea level/flood at highest point	[3]	
	(ii)	Reduce carbon dioxide/GHG emissions/set targets to reduce GHG; Help reduce amount of fossil fuels used/burned; Helps monitoring pollution/encourages alternative fuel sources/ makes people recycle more	[1]	10
4	(a) (i)	Nervous/nerve system	[1]	
	(ii)	Hormone	[1]	
	(iii)	By the circulatory system/in blood/plasma	[1]	
	(b) (i)	Pancreas	[1]	
	(ii)	• More or greater/increased respiration; • (Conversion of) glucose to glycogen/stores/turns it into glycogen.	[2]	
	(c)	Any **two** from: • Amy's blood glucose was higher before the meal/resting/normally; • After eating, Amy's blood glucose rises to a higher level; **or** • Amy's blood glucose is higher • Amy's blood glucose takes a longer time to return to normal/fall/ to decrease; • Amy's blood glucose rises faster after eating.	[2]	8

				AVAILABLE MARKS
5	(a)	(i)	18 [1]	
		(ii)	(21 × 20 × 4.2); ÷ 2; = 882 J 3 marks on own 2 marks with working: 18 → 756; 28 → 1176; 35 → 1470 [3]	
		(iii)	Raised water temperature the most/temp goes highest [1]	
		(iv)	Reliability/calculate average/identify anomolies [1]	
	(b)		Heat energy lost to surroundings/environment/tongs/glass tube in classroom experiment/or converse/fat drips off nothing to stop heat escaping (to environment) [1]	
	(c)		Obesity/CHD/diabetes/stroke/high blood pressure/high cholesterol/ overweight/heart attack [1]	8
6	(a)	(i)	Light/sunlight [1]	
		(ii)	Trophic Level 2/2nd [1]	
		(iii)	Economic: Timber industry will lose its supply of oak/no profit/lose jobs Environmental: Biodiversity reduced/loss habitat/food source lost/ wildlife reduced Max. 1 if wrong way round [2]	
	(b)	(i)	 1 mark = container + lid (any) drawn 1 mark = container + lid labelled [2]	
		(ii)	Any **two** from: • A container is buried underground • Allow insects in (or an animal small enough to fall in) • Left for 24 hours/a time period [2]	8

AVAILABLE MARKS

7 **(a)** Iodine (solution)
Starch: Blue/black or Black;
Protein: Blue [3]

(b) Any 2 from 3 of first three points
1st 2 marks:
Make a suspension of food sample/mix some sandwich in water/add water/ make solution
Add ethanol/alcohol;
Mix/shake;
3rd mark:
Observe a white emulsion (nothing else) if fat is present [3]

(c) **(i)** All 5 points plotted correctly for 2 marks (3 correct for 1 mark)
Straight line from point to point drawn/smooth curve acceptable [3]

(ii) pH 7 [1]

(iii) Activity increases from pH 4–7;
from pH 7–10, activity decreases
- higher as it goes to neutral = 1 mark
  lower as it goes away from neutral = 1 mark
- increases then decreases with no data = 1 mark
- goes up to max. 96% = 1 mark
  goes back down to zero = 1 mark

If answer states 'starch' rather than breakdown % then max. 1
maximum at pH7 on own = 0 mark
goes to a maximum of pH7 = 1 mark [2]

(d) Indicative content – Any 6 points

- Amylase works in the mouth
- Amylase does not work in stomach
- Amylase works in the small intestine
- Starch digestion incomplete in mouth
- Amylase is destroyed in the stomach (by acid conditions)
- So amylase needs to work again in the small intestine/by pancreas to complete the digestion of starch
- Amylase digests starch into glucose

Band	Response	Mark
A	Candidates use appropriate terms throughout to explain the activity of amylase in the various regions of the intestine using **five to six** points from the indicative content. They use good spelling, punctuation and grammar. Form and style are of a high standard.	[5–6]
B	Candidates use appropriate terms throughout to explain the activity of amylase in the various regions of the intestine using **three to four** points from the indicative content. They use satisfactory spelling, punctuation and grammar. Form and style are of a satisfactory standard.	[3–4]
C	Candidates use **one to two** points from the indicative content to explain the activity of amylase in the intestine. They use limited spelling, punctuation and grammar. They make limited use of specialist science terms.	[1–2]
D	Response not worthy of credit.	[0]

[6] 18

Total **70**

AVAILABLE MARKS