



**General Certificate of Secondary Education**  
**January 2019**

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**Biology**

Unit 1

Higher Tier

**[GBY12]**

**MONDAY 14 JANUARY, MORNING**

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**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.

- 1 (a) A – Photosynthesis; [1]  
 B – Respiration; [1]  
 C – Fossilisation; [1] [3]
- (b) (i) As CO<sub>2</sub> increases so does temperature/correlation described; [1]  
 (ii) Increased combustion of fossil fuels/increased population; [1]
- (c) Heat enters the earth's atmosphere; [1]  
 Less escapes back out/more reflects back to Earth; [1]  
 Temperature rises; [1] [3]

- 2 (a) Quadrat; [1]
- (b) Forest A has more species; [1]  
 6 vs 3; [1] [2]
- (c) Forest A has:  
 Higher light intensity; [1]  
 Higher temperature; [1]  
 More photosynthesis; [1] [3]

### 3 Indicative Content

- Squeeze/crush juice from fruit;
- Use known/measured volume of juice/reagent;
- DCPIP;
- Colour change from blue to pink/clear;
- Count number of drops/measure volume required for colour change;
- More drops means less vitamin C in juice/or converse.

**Accept:** bullet points which start with capital letter, contain a verb and end in full stop as sentences.

Band	Response	Mark
A	Candidates <b>must use appropriate, specialist terms</b> throughout <b>using at least 5 of the points</b> . They use <b>good</b> spelling, punctuation and grammar and the form and style are of a <b>high</b> standard.	[5]–[6]
B	Candidates <b>use some appropriate, specialist terms</b> throughout <b>using at least 3 of the points</b> . They use <b>satisfactory</b> spelling, punctuation and grammar and the form and style are of a <b>satisfactory</b> standard.	[3]–[4]
C	Candidates make <b>little use of specialist terms</b> throughout <b>using at least 1 of the points</b> . The spelling, punctuation and grammar, form and style are of a <b>limited</b> standard.	[1]–[2]
D	Response not worthy of credit.	[0]

[6]

6

			AVAILABLE MARKS	
4	(a)	A – Bacteria/Prokaryote; [1] B – Protoctista; [1] C – Animalia; [1]	[3]	
	(b)	Nucleus; [1] Multicellular; [1]	[2]	
	(c)	Lack cellular organisation/considered non-living by some;	[1]	
	(d)	Any <b>one</b> from: Study of how organisms have changed through time; Comparison of biodiversity; Conservation of species;	[1]	7
5	(a)	Chemical message; [1] Carried in the blood; [1] To a target organ; [1]	[3]	
	(b)	Pancreas;	[1]	
	(c)	(i) Data plotted accurately; [2] Points joined by single line; [1]	[3]	
		(ii) Carbohydrate; [1] Food/carbohydrate broken down/digested into glucose; [1] (Glucose) absorbed by blood; [1]	[3]	
		(iii) Blood glucose levels increases/rises more/described; [1] Larger fluctuations described; [1]	[2]	
	(d)	(i) Glucagon;	[1]	
		(ii) Liver;	[1]	14
6	(a)	Any <b>two</b> from: pH; Size/surface area of egg white; Concentration of enzyme; Volume of enzyme;	[2]	
	(b)	(i) Protease;	[1]	
		(ii) Amino acids;	[1]	
	(c)	(i) Description – As temperature increases, time taken to break down egg white decreases; [1] Increases kinetic energy of molecules/molecules move faster; [1] More collisions/enzyme substrate complexes formed/more proteins broken down; [1] 40°C – optimum temperature; [1]	[3]	
		(ii) Any <b>two</b> from: Enzyme denatured; Active site damaged so no longer complementary to shape of protein; Less successful collisions/less substrate broken down;	[2]	9

			AVAILABLE MARKS
7	(a) O <sub>2</sub> ; [1] CO <sub>2</sub> , H <sub>2</sub> O; [1] Balanced/6 in front'; [1]	[3]	7
	(b) (i) No oxygen/limited oxygen;	[1]	
	(ii) More energy released during aerobic;	[1]	
	(c) Muscle – Lactic acid vs Yeast – ethanol; [1] Muscle – no CO <sub>2</sub> vs Yeast – CO <sub>2</sub> ; [1]	[2]	
8	(a) (Plant) hormone;	[1]	12
	(b) Shoot tip; [1] When covered in experiment 2 seedling grows straight/no bending; [1]	[2]	
	(c) <i>Description:</i> Seedling in experiment 4 bends towards light; 3 grows straight; [1]  <i>Explanation:</i> Hormone/auxin passes through permeable jelly but not thin metal; [1] Diffuses down shoot in experiment 4 [not 3]; [1] Accumulates on shaded side of 4; [1] Causes cell elongation; [1]	[5]	
	(d) (i) (Selective) weed-killer; [1] Stimulate the formation of roots at end of (cut) stems; [1] Tissue culture; [1]	[3]	
	(ii) Stimulation of flowering/fruit formation;	[1]	
	(c) (i) [13.4 × 100], [1] ( <b>Accept:</b> 1340) [5 × 180], [1] ( <b>Accept:</b> 900) [6 × 50], [1] ( <b>Accept:</b> 300) Correct computation = 2028; [1] ( <b>Accept:</b> for [3] marks)	[3]	
9	(a) Decreases (with age);	[1]	8
	(b) Increases; [1] His energy intake is greater than his energy requirement; [1]	[2]	
	(ii) BMR less than average daily requirement/2028 is less than 2450; [1] ( <b>Accept:</b> converse) Reason: BMR takes into account activity; [1]	[2]	
10	(a) B; C: A;	[2]	10
	(b) A – purple; [1] B – yellow; [1]	[2]	
	(c) Photosynthesis = respiration; [1] CO <sub>2</sub> used = CO <sub>2</sub> produced; [1] Compensation point; [1]	[3]	
	(d) Hydrogencarbonate indicator would turn less yellow/stay red; [1] Lower temperature reduces reaction rates; [1] Slower rate of respiration; [1]	[3]	

- 11 (a) Ammonium (compounds); [1]  
 Denitrification; [1]  
 Nitrates; [1]  
 Nitrogen (gas); [1]  
 Nitrates; [1]  
 Decomposition; [1] [6]
- (b) (i) Runoff/leaching; [1]
- (ii) **Indicative content:**
1. Algal bloom (described);
  2. Algae die;
  3. Due to shading/mineral depletion;
  4. Decomposition;
  5. (Aerobic) bacteria;
  6. Uses oxygen;
  7. Animals die;
- Accept:** bullet points which start with capital letter, contain a verb and end in full stop as sentences.

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[6]

**Total**AVAILABLE  
MARKS

13

**100**