



Rewarding Learning

General Certificate of Secondary Education
2012–2013

Double Award Science: Biology

Unit B1

Foundation Tier

[GSD11]

MONDAY 25 FEBRUARY 2013
9.30 am–10.30 am

**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) emissions reduce [1]	
	(b) residential – using less electricity/using less energy more expensive/more insulation/more efficient heating/alternative energy source/renewable energy being used/named [2] waste source – less waste produced/more recycling [2]	
	(c) Global temperature increase/melting of polar ice caps/flooding/global warming [1]	
	(d) tackle problem worldwide/CO ₂ levels have worldwide effects/to allow targets to be set/to control CO ₂ emissions/allows monitoring of CO ₂ produced worldwide [1]	
	(e) may affect countries' development or described (economics/jobs)/energy supply [1]	
	(f) wind/solar/tidal/geothermal/hydroelectric/wave [1]	7
2	(a) (i) six or seven points correctly plotted [2]; (four or five points correctly plotted [1];) correct scale on X axis written in [1]; points joined by straight lines [1]; [4]	
	(ii) 30°C [1]	
	(iii) enzymes responsible (for photosynthesis); damaged (denatured) [2]	
	(b) (i) light mineral level/CO ₂ level/pH of soil [1]	
	(ii) glucose/starch/sugar [1]	
	(iii) chlorophyll [1] cell walls [1] [2]	11

		AVAILABLE MARKS
3	(a) (i) $20 \times 4.2 \times 11; = 924 \text{ kJ};$	[2]
	(ii) Fried contains <i>oil</i> which contains more <i>energy</i> /more kJ	[1]
	(iii) less energy/less fat/less calories/less kJ	[1]
	(iv) <i>less chance</i> of CHD/stroke/diabetes/cancer	[1]
	(v) heat lost to atmosphere/air heat lost to glass/foil dish;	[2]
	(b) glucose; carbon dioxide;	[2]
	(c) any three from:	
	• large surface area (for diffusion) large area of contact between the two surfaces;	
	• wall of alveolus one cell thick/thin/short diffusion distance;	
	• <i>capillary</i> one cell thick/thin;	
	• good blood supply lots of RBCs	[3]
		12
4	(a) <i>phototropism</i>	[1]
	(b) auxin	[1]
	(c) (i) No hormone/auxin produced/no shoot tip present; no growth/no cell elongation	[2]
	(ii) Any 4 from: shoot tip bends to light; hormone auxin moves to side away from light/shaded side; <i>cell elongation</i> on side away from light; more growth on side away from light/bends more on shaded side; shoot gets more light/can photosynthesise more ;	[4]
		8

- 5 (a) (i) protein [1]
- (ii) protease/pepsin
- (iii) any two from: [1]
- amount of enzyme/volume of enzyme solution;
 - concentration of enzyme;
 - pH of solution;
 - same size/amount of gelatin cubes [2]
- (b) Indicative content
- no **breakdown** of gelatin/cube stays intact
 - no amino acids produced
 - amylase *not* specific for **protein/amylase** is specific for **starch**
 - **protease** is only enzyme that breaks down gelatin
 - **lock and key** model of enzyme activity
 - **shape** of amylase does not fit with protein (gelatin)
 - **temperature** is **not** the cause 35 °C/35 °C is the optimum temperature for enzyme activity.

Response	Mark
Candidates use appropriate terms throughout to describe and explain in a logical manner what happens to the gelatin giving at least 5 points from the indicative content. They use good spelling, punctuation and grammar skills. Form and style are of a high standard.	[5–6]
Candidates use some appropriate terms throughout to partially describe and explain what happens to the gelatin giving 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 partially describe or explain what happens to the gelatin. They give 1 or 2 points from the indicative content. They use limited spelling, punctuation and grammar skills.	[1–2]
Response not worthy of credit.	[0]

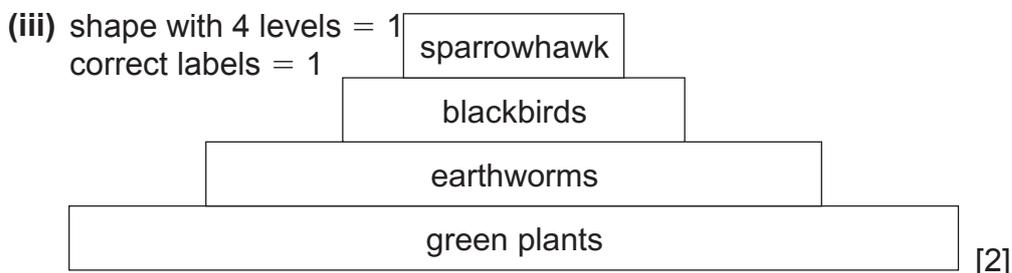
[6]

10

- 6 (a) brain and spinal cord [1]
- (b) Any two from:
co-ordination/or described e.g. controls movement through nerves;
send impulses/messages to brain/CNS;
response/action to body/muscles; [2]
- (c) nervous system *faster* than hormones [1]

4

- 7 (a) (i) invertebrates/insects/named examples [1]
- (ii) any three from:
 ● dig hole;
 ● put in jar/container;
 ● put cover on top; supported to allow invertebrate entry
 ● return after certain time/leave overnight
 ● identify/count organisms. [3]
- (b) (i) decomposition/decay [1]
- (ii) any two from:
 ● segmented body;
 ● chaetae
 ● body temperature not constant [2]
- (c) (i) quadrat [1]
- (ii) 20 [1]
- (iii) more (in grass area)/fewer in quarry [1]
- (iv) not much soil in quarry/not much decaying matter/mostly rock/too dry or converse/damper near stream in a meadow [1]
- (v) repeat [1]
- (vi) not all worms come up to the surface/some remain underground [1]
- (d) (i) blackbird/sparrowhawk [1]
- (ii) less earthworms;
 more eaten by blackbirds/because blackbirds have less/
 no beetles to eat
 or
 less earthworms; because more aphids/less green plants [2]



Total

**AVAILABLE
MARKS**

18

70