



**General Certificate of Secondary Education
2018**

Biology

Unit 1

Higher Tier

[GBY12]

FRIDAY 8 JUNE, 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.

- 1 (a) (i) Phototropism; [1]
(ii) Auxin; [1]
(iii) Uneven distribution of hormone/described; [1]
differential growth of cells/described; [1] [2]
- (b) Any **one** from:
Rooting powder;
Weed killer;
Tissue culture;
Stimulation of flowering;
Fruit formation; [1]
- 2 (a) Foxes, hawks; } [1] for each horizontal line.
Frogs, thrushes;
Rabbits, slugs; } [3]
- (b) Make own food/Photosynthesis; [1]
Provides food for other animals in web; [1] [2]
- 3 (a) 2 layers of cells + upper longer than lower palisade; [1]
upper palisade 4/5 complete cells, no large air spaces; [1]
Lower palisade 4/6 cells + shape representative + 1 or 2 air spaces; [1] [3]
- (b) Correct labels [\times 2]; [2]
- 4 **Indicative Content**
- Age;
 - 5-year-old needs 8000 kJ, teenage girl needs 12 000 kJ;
 - Gender/sex;
 - Teenage boy needs 16 000 kJ, teenage girl needs 12 000 kJ/man doing light work needs 13 800 kJ, woman doing light work needs 11 800 kJ;
 - Activity;
 - Man doing light work needs 13 800 kJ, man doing heavy work needs 20 000 kJ;

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

[6]

6

		AVAILABLE MARKS
5	(a) (i) Intercostal muscle;	[1]
	(ii) Any two from: Diaphragm moved up/domed shape; [1] Ribs move down/in; [1] Chest/lung volume decreased; [1]	[2]
	(b) Rubber sheet pulled down; [1] Volume inside bell jar increases; [1] Pressure (inside bell jar) decreases; [1] Atmospheric air pressure forces air in; [1]	[4]
(c) Bell jar does not move/rib cage moves;	[1]	8
6	(a) Any four from: Active site; Complementary (in shape) to substrate; Enzyme–substrate complex; Lock and key; Products released /enzyme re-used ;	[4]
	(b) (i) Accurate points plotted $\times 2$; [2] Line drawn between plots; [1]	[3]
	(ii) (Different) optimum pH; [1] A – 3 and B – 8; [1] Denatured; [1]	[3]
7	(a) (i) Carbohydrate digested into glucose; [1] (Glucose) absorbed into blood; [1]	[2]
	(ii) Insulin; [1] Liver; [1]	[2]
	(iii) Any two from: (Increased) uptake of glucose by liver; Glucose converted to glycogen/fat; Increased respiration;	[2]
	(b) (i) $72693 - 51541 = 21152$; [1] $21152 \div 51541 \times 100$; [1] $= 41(\%)$ [1]	[3]
	(ii) Obesity; Lack of exercise;	[2]
(iii) Eye damage/kidney failure/heart disease/stroke;	[1]	
(iv) Treatment cost/loss of work force/cost of benefits;	[1]	13

		AVAILABLE MARKS
8	<p>(a) Average: $(0.76 + 0.48 + 0.74) \div 3 = 0.66$; [1] $0.1 \div 0.66$; [1] $= 0.15$; [1]</p> <p>(b) Any two from: 0.48; Anomaly/does not fit trend; More repetitions needed;</p> <p>(c) Difficult to see the colour change because of orange colour of juice;</p>	<p>[3]</p> <p>[2]</p> <p>[1]</p> <p>6</p>
9	<p>(a) (i) A – Association/relay; [1] B – Sensory; [1]</p> <p>(ii) Insulated/sheath; Speeds up impulses; or Branched ends; Connects with other neurones;</p> <p>(iii) Reflex occurs rapidly; [1] Does not involve conscious thought; [1]</p> <p>(b) Any four from: Transmitter released (from vesicle); (Transmitter) diffuses across the synapse; (Transmitter) attaches to (receptors in) D; Threshold/high concentration of transmitter in D; Triggers electrical impulse;</p>	<p>[2]</p> <p>[2]</p> <p>[2]</p> <p>[4]</p> <p>10</p>

- 10 (a) (i) Field C; [1]
Lowest percentage of air; [1] [2]
- (ii) Drainage;
Plough/cultivate; [2]

(b) Indicative Content

1. Highest % of air/oxygen in soil/39%/more aerobic;
2. For cell respiration/energy released;
3. Allows most **active** uptake (of nitrates/minerals from soil);
4. Clover plants (in B) contain nitrogen fixing bacteria;
5. (Nitrogen fixing bacteria) converts $N_2 \rightarrow$ nitrates;
6. Plants convert nitrates into amino acids/proteins for growth;
7. More decomposition of slurry by aerobic bacteria/more nitrification/
less denitrification; (in aerobic context).

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C	Candidates make little use of specialist terms throughout to describe and explain their conclusions using at least 1 of the points . The spelling, punctuation and grammar, form and style are of a limited standard .	[1]–[2]
D	Response not worthy of credit.	[0]

[6]

10

AVAILABLE
MARKS

		AVAILABLE MARKS
11	(a) (i) A – Cornea;	[1]
	(ii) B – Aqueous humour;	[1]
	(b) Ciliary muscles <u>relax</u> ; [1] Suspensory ligaments <u>pull</u> on lens/taut; [1] Lens becomes <u>thinner</u> ; [1]	[3]
	(c) Circular muscles relax; [1] Radial muscles contract; [1] Pupil dilates/iris narrows; [1] More light enters; [1]	[4]
12	(a) $6\text{H}_2\text{O}$; [1] 6CO_2 ; [1] 6O_2 ; [1]	[3]
	(b) (i) Negative/–20; O_2 used; in respiration; no/less sunlight; no/less/for photosynthesis;	[5]
	(ii) Compensation point; Rate of respiration = rate of photosynthesis; O_2 in = O_2 out;	[3]
	(iii) Rate of photosynthesis higher than respiration rate; Light no longer limiting /another factor limiting ;	[2]
Total		13
		100