Rewarding Learning

General Certificate of Secondary Education
2022

Biology

Unit 1

Foundation Tier

[GBL11]

TUESDAY 17 MAY, MORNING

MARK SCHEME

General Marking Instructions

Introduction

Mark schemes are intended to ensure that the GCSE examinations are marked consistently and fairly. The mark schemes provide markers with an indication of the nature and range of candidates' responses likely to be worthy of credit. They also set out the criteria which they should apply in allocating marks to candidates' responses.

Assessment objectives

Below are the assessment objectives for GCSE Biology.

Candidates must:

AO1 demonstrate knowledge and understanding of: scientific ideas; and scientific techniques and procedures;

AO2 apply knowledge and understanding of and develop skills in: scientific ideas; scientific enquiry, techniques and procedures; and

AO3 analyse scientific information and ideas to: interpret and evaluate; make judgements and draw conclusions and develop and improve experimental procedures.

Quality of candidates' responses

In marking the examination papers, examiners should be looking for a quality of response reflecting the level of maturity which may reasonably be expected of a 16-year-old which is the age at which the majority of candidates sit their GCSE examinations.

Flexibility in marking

Mark schemes are not intended to be totally prescriptive. No mark scheme can cover all the responses which candidates may produce. In the event of unanticipated answers, examiners are expected to use their professional judgement to assess the validity of answers. If an answer is particularly problematic, then examiners should seek the guidance of the Supervising Examiner.

Positive marking

Examiners are encouraged to be positive in their marking, giving appropriate credit for what candidates know, understand and can do rather than penalising candidates for errors or omissions. Examiners should make use of the whole of the available mark range for any particular question and be prepared to award full marks for a response which is as good as might reasonably be expected of a 16-year-old GCSE candidate.

Awarding zero marks

Marks should only be awarded for valid responses and no marks should be awarded for an answer which is completely incorrect or inappropriate.

Marking calculations

In marking answers involving calculations, examiners should apply the 'own figure rule' so that candidates are not penalised more than once for a computational error.

Types of mark schemes

Mark schemes for tasks or questions which require candidates to respond in extended written form are marked on the basis of levels of response which take account of the quality of written communication.

Other questions which require only short answers are marked on a point for point basis with marks awarded for each valid piece of information provided.

Levels of response
Tasks and questions requiring candidates to respond in extended writing are marked in terms of levels of response. In deciding which level of response to award, examiners should look for the 'best fit' bearing in mind that weakness in one area may be compensated for by strength in another. In deciding which mark within a particular level to award to any response, examiners are expected to use their professional judgement. The following guidance is provided to assist examiners.

Threshold performance: Response which just merits inclusion in the level and should be awarded a mark at or near the bottom of the range.

Intermediate performance: Response which clearly merits inclusion in the level and should be awarded a mark at or near the middle of the range.

High performance: Response which fully satisfies the level description and should be awarded a mark at or near the top of the range.

Quality of written communication
Quality of written communication is taken into account in assessing candidates' responses to all tasks and questions that require them to respond in extended written form. These tasks and questions are marked on the basis of levels of response. The description for each level of response includes reference to the quality of written communication.

For conciseness, quality of written communication is distinguished within bands of response as follows:

Band A: Quality of written communication is excellent.
Band B: Quality of written communication is good.
Band C: Quality of written communication is basic.

In interpreting these level descriptions, examiners should refer to the more detailed guidance provided below:

Band A (Excellent): The candidate successfully selects and uses the most appropriate form and style of writing. Relevant material is organised with a high degree of clarity and coherence. There is widespread and accurate use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of a sufficiently high standard to make meaning clear.

Band B (Good): The candidate makes a reasonable selection and use of an appropriate form and style of writing. Relevant material is organised with some clarity and coherence. There is some use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are sufficiently competent to make meaning clear.

Band C (Basic): The candidate makes only a limited selection and use of an appropriate form and style of writing. The organisation of material may lack clarity and coherence. There is little use of specialist vocabulary. Presentation, spelling, punctuation and grammar may be such that intended meaning is not clear.

COVID-19 Context
Given the unprecedented circumstances presented by the COVID-19 public health crisis, senior examiners, under the instruction of CCEA awarding organisation, are required to train assistant examiners to apply the mark scheme in case of disrupted learning and lost teaching time. The interpretation and intended application of the mark scheme for this examination series will be communicated through the standardising meeting by the Chief or Principal Examiner and will be monitored through the supervision period. This paragraph will apply to examination series in 2021-2022 only.

				AVAILABLE MARKS
1	**(a)**	Tissues; organs;	[2]	
	(b)	Any **two** from: respiratory; digestive; excretory; reproductive; nervous; circulatory;	[2]	4
2	**(a)**	Grasshoppers, small birds; arrows;	[2]	
	(b)	Fox;	[1]	
	(c)	The foxes have less rabbits to eat; therefore eat more mice;	[2]	
	(d)	Sunlight;	[1]	6
3	**(a)**	A = photosynthesis; B = fossilisation; C = respiration;	[3]	
	(b)	Less carbon dioxide in the atmosphere; less combustion; of fossil fuels/coal, gas and oil;	[3]	6
4	**(a)**	Cell membrane;	[1]	
	(b)	Arrow into cell;	[1]	
	(c)	More oxygen molecules outside the cell than inside/diffusion gradient;	[1]	
	(d)	Any **two** from: increased temperature; larger surface area; greater diffusion gradient;	[2]	5
5	**(a)**	**(i)** Oxygen; carbon dioxide; water;	[3]	
		(ii) Any **two** from: heat; growth; movement; reproduction;	[2]	
	(b)	Any **two** from: Lactic acid produced (in anaerobic); Carbon dioxide not produced (in anaerobic); Less energy released (in anaerobic); Water is not produced (in anaerobic); Oxygen is not required (for anaerobic);	[2]	7

				AVAILABLE MARKS
6	**(a)**	**(i)**	Carry information from one part of the body to another/communication described; [1]	
		(ii)	Electrical; fast, slow; [2]	
	(b)	**(i)**	A = brain; B = spinal cord; [2]	
		(ii)	Salivary gland; [1]	6
7	**(a)**	**(i)**	Palisade Mesophyll; Lower Epidermis; [2]	
		(ii)	To prevent water loss/prevent entry of microbes; [1]	

(b) Indicative content:

Any **three** pairs from:

1. Waxy cuticle/Upper epidermis;
2. Transparent to allow light in;
3. Palisade mesophyll elongated/tightly packed/many chloroplasts;
4. Max light absorption;
5. Spongy mesophyll;
6. Large surface area/air spaces for gas exchange;
7. Lower epidermis has stomata;
8. To allow diffusion of gases;
9. Thin/flat;
10. For large surface area;

Band	Response	Mark
A	Candidates **must use appropriate, specialist terms** throughout to describe and explain their conclusions **using <u>at least 5</u> 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 <u>at least 3</u> 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 <u>at least one</u> 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] 9

					AVAILABLE MARKS
8	**(a)**		4 minutes; breathing rate increases for both students;	[2]	
	(b)	**(i)**	Student A – 12; Student B – 16;	[2]	
		(ii)	Has lower maximum breathing rate; 35 vs 45 has a shorter recovery time; 4 minutes compared to 8 minutes.	[4]	
	(c)		Increased depth of breathing;	[1]	9
9	**(a)**		Quadrat;	[1]	
	(b)		Both areas have the same number of plant species;	[1]	
	(c)		Moss; grows better in area B (than in area A); area B has a lower light intensity;	[2]	
	(d)		Water/wind speed;	[1]	5
10	**(a)**	**(i)**	Root hair cells;	[1]	
		(ii)	Active transport/absorption;	[1]	
		(iii)	Extension/large surface area;	[1]	
	(b)	**(i)**	180 – 120; (60 ÷ 120) × 100; 50%;	[3]	
		(ii)	As amount of fertiliser added is increased, the yield increases; then levels off;	[2]	
		(iii)	Some minerals already in the soil;	[1]	
		(iv)	maximum yield of crop is 80 kg; with least cost/lead to eutrophication; leaching/algal bloom/run-off/wash away;	[2]	11
11	**(a)**	**(i)**	Saprophytic;	[1]	
		(ii)	Secrete enzymes/release enzymes/extracellular; Digestion/described; Products absorbed;	[3]	
	(b)	**(i)**	30 °C and high water content; Least mass of leaf remains/most decomposed;	[2]	
		(ii)	Enzymes denatured/kills decomposers	[1]	7
				Total	**75**