Rewarding Learning

General Certificate of Secondary Education
2019

Biology

Unit 2

Higher Tier

[GBL22]

FRIDAY 7 JUNE, 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.

B**and 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.

			AVAILABLE MARKS
1	(a)	Uncontrolled/abnormal; cell division; [2]	
	(b)	Any **two** from: Need comparative term Body cell membrane **thinner**; Body cell nucleus **smaller**; Body cell rectangular; tumour cell rounded; [2] Accept converse for tumour cells	
	(c) (i)	X and Y chromosome present; [1]	
	(ii)	3 and 12; [1] Accept in either order.	
	(iii)	Mutation(s); [1]	
	(d)	Any **two** from: Early detection; detection before spread; Increased chance of cure/increased survival rates; [2]	9
2	(a) (i)	Double helix; [1]	
	(ii)	Sugar; Phosphate; Accept in either order [2]	
	(iii)	Nucleus; [1]	
	(iv)	Base(s); Sequence; [2]	
	(b) (i)	**G** – 18%; 100 – 36 = 64; 64 ÷ 2 [/**A** = **T**] = 32%; [3]	
	(ii)	Any **three** from: **Must be comparison across all 4 species** Most cytosine in grasshopper; Least in yeast; Cytosine percentage similar in all four organisms; Less cytosine than A/T; Cytosine percentage similar to G; [3]	12
3	(a)	**A** – pulmonary vein; **B** – hepatic artery; **C** – renal vein; [3]	
	(b)	Any **two** from: Vessel **A** has **more** oxygen; Vessel **A** has **less** carbon dioxide; Vessel **A** has **more** urea [2]	
	(c)	Transports digested/absorbed food molecules (named example); **From** the intestine **to** the liver; [2]	
	(d)	Blood passes **through the heart twice in** each full circulation; [1]	8

					AVAILABLE MARKS
4	(a)	(i)	**A** – Placenta; **B** – Uterus **wall**; **C** – Vagina; ***Reject:*** *Uterus*	[3]	
		(ii)	**D** – Amniotic fluid; **Function** – protect/cushion foetus [from physical damage];	[2]	
	(b)		Carbon dioxide; Urea;	[2]	7
5	(a)	(i)	Flagellum; ***Reject:*** *Tail*	[1]	
		(ii)	Mitochondrion;	[1]	
	(b)	(i)	Sperm and egg **nuclei**; **Fuse**;	[2]	
		(ii)	Zygote;	[1]	
		(iii)	(Divides by) mitosis; Forms a ball of cells/embryo;	[2]	7
6	(a)		Any **three** from: Ovaries may not release/produce an egg; Oviducts blocked; Uterine/vagina environment hostile; Man has a low sperm count; Sperm may have low motility/unhealthy; STI complications/cancer; Impotence; Menopause;	[3]	
	(b)	(i)	fertility drugs;	[1]	
		(ii)	**Increases the chances** that one egg may be fertilised/embryo is formed;	[1]	
	(c)	(i)	Embryo sinks into; Uterus **lining**;	[2]	
		(ii)	Differentiation;	[1]	8
7	(a)		More glucose and/oxygen; Increased respiration/energy produced; Increased muscle **contractions**; *More/increased required only once*	[3]	
	(b)	(i)	125 × 65 = 8125; 8125 – 6080 = 2045;	[2]	
		(ii)	Stronger heart **muscle**;	[1]	6

					AVAILABLE MARKS
8	**(a)**		Droplet infection;	[1]	
	(b)	**(i)**	Body produces antibodies;	[1]	
		(ii)	Dead/weakened/attenuated form of bacterium;	[1]	
	(c)	**(i)**	**Similarity**: both decrease; **Differences**: V_1 greater fall in numbers; V_1 decreases faster/in a shorter period of time;	[3]	
		(ii)	Booster (vaccinations);	[1]	
		(iii)	**More** memory cells/**longer-term** immunity;	[1]	
		(iv)	Spread from person to person in school/antibodies used up/not enough memory cells/five years since last vaccination;	[1]	9
9	**(a)**	**(i)**	Hh; HH;	[2]	
		(ii)	Hh;	[1]	
			Any **three** from; Father does not have Huntington's disease/genotype hh/cannot pass disease to children; Children that have got H from mother; Children who have got h from mother;	[3]	
	(b)	**(i)**	All the genetic material/DNA (in foetus);	[1]	
		(ii)	Amniocentesis/blood test;	[1]	
		(iii)	Any **one** from: Who decides those to be tested; Risks of amniocentesis/test /described; Dilemma of carriers after positive test/described; Availability of genetic information to wider society;	[1]	9
10	**(a)**		Preclinical (trial); Human (volunteers);	[2]	
	(b)	**(i)**	Living animals;	[1]	
		(ii)	May be toxic;	[1]	
	(c)		Too little may be ineffective; Too much may cause side effects;	[2]	
	(d)		Results are checked by other scientists;	[1]	7

AVAILABLE MARKS

11 **(a)** More access to food/lemmings; [1]

(b) **Indicative Content**
Number of brown owls increase;
Brown owls more camouflaged;
Less brown owls eaten (by eagle owls);
More brown owls survive;
More brown owls reproduce;
Pass on **genes** to offspring;
Accept: *Grey plumage less camouflaged/more predated;*

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]

(b) Owls with grey plumage die out/become extinct; [1] 8

Total **90**