Rewarding Learning

General Certificate of Secondary Education
2024–2025

Single Award Science: Biology

Unit 1

Higher Tier

[GSA12]

TUESDAY 13 MAY 2025, AFTERNOON

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 Single Award Science

Candidates must:

AO1 Demonstrate knowledge and understanding of scientific ideas, scientific techniques and procedures;

AO2 Apply knowledge, skills and understanding of scientific ideas, scientific enquiry, techniques and procedures; and

AO3 Analyse information and ideas to interpret and evaluate; make judgements and draw conclusions; 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.

Where one response is required to gain a mark, candidates will not gain credit if a correct response is given alongside one or more incorrect responses. This is referred to as listing.

AVAILABLE MARKS

1 **(a)** Uncontrolled cell division [1]

(b) Any **two** from:
- (cancer cells) have a larger nucleus (comparison required)
- (cancer cells) are smaller (comparison required)
- (cancer cells) are irregularly arranged
- (cancer cells) can move into the blood/more (cancer cells) [2]

(c) Malignant because it is spreading through the body in the bloodstream [1]

(d) UV/ultraviolet rays [1] 5

2 **(a)** As the planting density increases, the average number of tomatoes on each plant decreases [1]
due to competition [1] for water/space/light/minerals etc. (or converse) [3]

(b) **(i)** 160 – 120 = 40 [1]
40/120 × 100 = 33.3% [1] [2]

(ii) More sunlight/chlorophyll [1] for more photosynthesis [1] [2] 7

AVAILABLE MARKS

3 **(a)** Any **two** from:
- chemical messenger
- travels in the blood
- to a target organ
- produced by a gland [2]

(b) **Indicative content**
- pancreas
- liver
- increased uptake of glucose
- conversion of glucose to glycogen
- increased respiration
- lowers blood glucose level
- diabetes

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe and explain the effect of insulin on blood glucose levels in the body using **five or more** of the points above, in a logical sequence. 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 the effect of insulin on blood glucose levels in the body using **three or four** of the points above, in a logical sequence. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	[3]–[4]
C	Candidates describe and explain the effect of insulin on blood glucose levels in the body using **one or two** of the above points. However, these are not presented in a logical sequence. They use limited spelling, punctuation and grammar and the form and style are of a limited standard.	[1]–[2]
D	Response not worthy of credit.	[0]

[6] 8

4 **(a)** **(i)** Shoot bends towards the light [1]

(ii) auxin [1]
moves down the shaded side [1]
causing differential growth of cells/(more) cell elongation on the shaded side [1] [3]

(b) shoot drawn straight [1]
shoot drawn longer [1] [2] 6

				AVAILABLE MARKS
5	**(a)**	Camouflage/hide/blend in [1] reproduce/breed [1] genes [1]	[3]	
	(b)	(Charles) Darwin	[1]	
	(c)	Any **two** from: • gradual changes in organisms • over time • which may result in the formation of a new species	[2]	6
6	**(a)**	More accurate/continuous reading	[1]	
	(b)	**(i)** 5 or 6 correct points [2] (4 points correct [1]) (less than 4 points correct [0]) straight lines joining the points [1]	[3]	
		(ii) (Student A's) pulse rate is lower [1] pulse rate returns to resting pulse rate quicker [1] (comparison required)	[2]	
	(c)	**(i)** Decreases pulse rate/time taken for pulse rate to return to resting pulse rate	[1]	
		(ii) Any **two** from: • strengthens the heart muscle • increases cardiac output at rest • reduces the risk of heart disease	[2]	
	(d)	$C_6H_{12}O_6$ [1] $6H_2O$ [1]	[2]	11

					AVAILABLE MARKS
7	**(a)**	**(i)**			

	B	b
B	BB	Bb
b	Bb	bb

Gametes correct [1]
correct cross [1] [2]

(ii) 50% [1]

(iii) bb circled [1]

(b) **(i)** Genetic screening [1]

(ii) Insurance is more expensive/won't get insured [1]

(iii) Down's syndrome/Cystic fibrosis [1] — 7

8 **(a)** **(i)** Days 1–5 shaded [1]

(ii) Oestrogen [1]
egg/ovum is released from the ovary [1] [2]

(iii) progesterone [1]

(b) **(i)** Contraceptive pill/hormone implant [1]

(ii) Fertilisation [1]

(c) **(i)** As the years increase the total number of babies born/births decrease [1]
and then from 2020/in 2021 the number of babies born/births increase [1] [2]

(ii) 10 731 [1]

(iii) More babies born male than female in every year [1] — 10

Total — **60**