Rewarding Learning

General Certificate of Secondary Education
2018–2019

Single Award Science: Biology

Unit 1

Higher Tier

[GSA12]

WEDNESDAY 27 FEBRUARY 2019, 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 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.

AVAILABLE MARKS

1 Indicative content

- cholesterol
- narrowing of artery
- blood cannot reach heart (muscle cells)
- oxygen/glucose cannot reach heart (muscle cells)
- respiration cannot take place
- heart muscle (cells) die

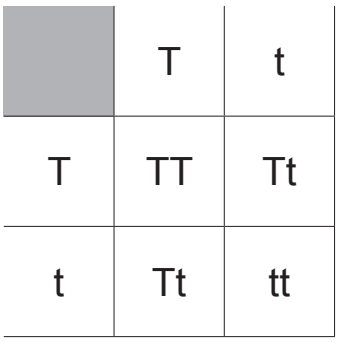
Any **two** from:

- stress
- smoking
- lack of exercise

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe steps leading to a heart attack using **six to eight** 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 to describe steps leading to a heart attack using **four or five** 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 partially describe steps leading to a heart attack using **one to three** of the above points. However, these are not presented in a logical sequence. They use limited spelling, punctuation and grammar and have made limited use of specialist terms. The form and style are of a limited standard.	[1]–[2]
D	Response not worthy of credit.	[0]

[6] 6

					AVAILABLE MARKS
2	(a)	(i)	Any **two** from: • produced by glands • travel in the blood • to a target organ	[2]	
		(ii)	Reduces blood glucose levels [1] Any **one** from: • converts glucose to glycogen • increased respiration • increases the rate at which glucose is moved into cells [1]	[2]	
	(b)		Type 1 diabetes [1] pancreas does not produce any insulin [1]	[2]	
	(c)	(i)	Phototropism	[1]	
		(ii)	Shoot visibly taller [1] shoot tips bent over towards the light [1]	[2]	
		(iii)	Grow straight up	[1]	10
3	(a)	(i)	Cushions the foetus	[1]	
		(ii)	Risk of Down's syndrome increases with age [1] under 35 risk of miscarriage exceeds that of Down's syndrome/ over 35 risk of Down's syndrome greater than miscarriage [1]	[2]	
		(iii)	No risk of having a miscarriage	[1]	
	(b)	(i)	Random changes in the structure/number [1] of chromosomes/genes/DNA [1]	[2]	
		(ii)	Cystic fibrosis	[1]	
	(c)	(i)	Double helix	[1]	
		(ii)	Genome	[1]	9
4	(a)		56 – 40 [1] = 16 [1] 16 [2]	[2]	
	(b)		Are chemicals [1] produced by fungi [1]	[2]	
	(c)	(i)	They have open wounds/more people with infection in one space/ infection can spread more easily	[1]	
		(ii)	Very few single rooms/mostly large wards	[1]	6

					AVAILABLE MARKS
5	(a)	(i)	Chemotherapy/radiotherapy	[1]	
		(ii)	Any **two** from: • Transfer of viruses or diseases from other animals • formation of tumours • development of unwanted cell types.	[2]	
	(b)	(i)	Any **two** from: • to see if the drug actually works on humans • to see if there are any side effects • to check the dosage that should be used.	[2]	
		(ii)	Testing on (living) cells [1] expensive equipment/specialised scientists/trial and error [1] specialised equipment	[2]	7
6	(a)	(i)	Sensory, relay, motor neurone, named in the correct order [1] (impulse is taken from the receptors) to the spinal cord by sensory neurones [1] motor neurone (carries the impulse) from the spinal cord to the effector [1]	[3]	
		(ii)	Muscle	[1]	
		(iii)	Synapse	[1]	
	(b)	(i)	3	[1]	
		(ii)	Reflex actions do not involve thinking time	[1]	7
7	(a)	(i)	3	[1]	
		(ii)	Grandmother	[1]	
		(iii)	 Gametes for Mark correct and Gametes for Jane correct [1] Offspring genotypes correct [1]	[2]	
		(iv)	25%	[1]	
	(b)		Both alleles of a gene are the same	[1]	6

					AVAILABLE MARKS
8	(a)	(i)	Haploid	[1]	
		(ii)	Nuclei fuse/fertilisation take place [1] zygote divides to form a ball of cells [1]	[2]	
	(b)	(i)	Repair and build-up of the uterus wall/stimulation of ovulation	[1]	
		(ii)	Progesterone [1] build up and maintenance of the uterine lining [1]	[2]	
	(c)		Yes, the sperm and ovum are both present in the oviduct	[1]	
	(d)		Contraceptive pill [1] prevents the ovaries releasing ova/stops development of ovum [1]	[2]	9
				Total	**60**