AQA GCSE Biology | 8461

SPECIFICATION POINT 4.3.1.5

Protist diseases

Mark schemes and examiner comments

Tier	**Foundation**
Question groups	**2**
Available paper years	**2019–2023**

Using this booklet

1. Booklet answer numbers match the question booklet.
2. Use the original question number within marking tables.
3. Examiner comments are included where available.

Name: _____ **Date:** _____

Where a precise marking extract is unavailable, the full source document is included in an appendix. Any missing mark scheme is explicitly identified.

4.3.1.5 Protist diseases

Answer 01 · Mark scheme June 2019 | 8461/1F | Original Q8

08.1	a protist		1	4.3.1.5 AO1
08.2	lower percentage of people with malaria when using (mosquito) nets	allow converse if clearly describing people who do not use (mosquito) nets allow fewer people with malaria when using (mosquito) nets allow **only** 1.2% of people with malaria when using (mosquito) nets ignore reference to data from table unqualified do **not** accept incorrectly calculated figures	1	4.3.1.5 AO3
08.3	any **one** from: • some people who use (mosquito) nets have malaria • data from only one area / part of Africa • size of group too small **or** sample size too small **or** only 476 people • only 50 people did not use (mosquito) nets **or** uneven group sizes (nets vs. no nets) • no other information about people considered • people may have lied about using (mosquito) nets	allow people can get malaria when they are not sleeping allow correlation does not imply causation allow examples of information not considered e.g. age, other medical issues such as sickle cell, whether taking anti-malarial medication, vaccination ignore ref to other factors unqualified	1	4.3.1.5 AO3
08.4	any value between 88 – 91	allow decimal values	1	4.3.1.5 AO2

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Answer 01 · Mark scheme

June 2019 | 8461/1F | Original Q8

Question	Answers	Extra information	Mark	AO / Spec. Ref.
08.5	any **one** from: • improved health care	allow examples of improved health care such as **more / cheaper / new** treatments / vaccinations / antibiotics	1	4.2.2.5 4.3.1.5 AO2
	• use of mosquito control methods	allow descriptions such as spraying of insecticides / repellent **or** draining water holes **or** preventing mosquitoes from breeding		
	• changing behaviour to avoid being bitten (by mosquitoes)	allow descriptions such as wear long clothing **or** avoid going out at dusk		

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Answer 01 · Mark scheme

June 2019 | 8461/1F | Original Q8

Question	Answers	Extra information	Mark	AO / Spec. Ref.
08.6	**Level 2:** Scientifically relevant facts, events or processes are identified and given in detail to form an accurate account.		4–6	4.3.1.6 4.3.1.7 AO1
	Level 1: Facts, events or processes are identified and simply stated but their relevance is not clear.		1–3	
	No relevant content		0	
	Indicative content ***prevents pathogens from entering*** **skin** • tough / dry / dead outer layer • skin acts as a barrier • sebum / oil on (surface of) skin • sebum / oil repels pathogens • scabs form over cuts **or** scabs form a barrier • platelets are involved in forming clots / scab **stomach** • contains (hydrochloric) acid • (HCl) kills bacteria • in food **or** in swallowed mucus **eyes** • produce tears • contains enzymes to kill bacteria • tears are antiseptic **breathing system** • trachea / bronchi / nose produce mucus • mucus is sticky • (mucus) traps bacteria • (mucus) carried away by cilia ***defends itself against pathogens inside the body*** • immune system / white blood cells (WBCs) • WBCs engulf pathogens • antitoxins are produced • (antitoxins) neutralise toxins / poisons (produced by pathogen) • antibodies are produced • (antibodies) help destroy pathogens • memory cells (are formed) • (memory cells give a) more rapid response if pathogen re-enters a **level 2** response should refer to body defence **and** the immune system			
Total			**11**	

4.3.1.5 Protist diseases

Answer 01 · Mark scheme

June 2019 | 8461/1F | Original Q8

Question	Answers	Extra information	Mark	AO / Spec. Ref.

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Answer 02 · Mark scheme

Question 4

Question	Answers	Extra information	Mark	AO / Spec Ref.
04.1	vector		1	AO1 4.3.1.5

Question	Answers	Extra information	Mark	AO / Spec Ref.
04.2	any **two** from: • (it has) mitochondria • (it has a) nucleus • (it has) no plasmids	if neither mark awarded, allow **1** mark for protist has membrane-bound structures allow it does not have a loop of DNA allow other appropriate features do **not** accept (it has) cytoplasm do **not** accept (it has) a (cell) membrane do **not** accept it has no cell wall	2	AO2 4.3.1.5 4.1.1.1

Question	Answers	Extra information	Mark	AO / Spec Ref.
04.3	Salmonella		1	AO2 4.1.1.1 4.3.1.3

Question	Answers	Extra information	Mark	AO / Spec Ref.
04.4	only one parent is involved		1	AO1 4.3.1.5 4.6.1.1

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Answer 02 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec Ref.
04.5	14		1	AO2 4.3.1.5 4.1.2.2

Question	Answers	Extra information	Mark	AO / Spec Ref.
04.6	decreased haemoglobin		1	AO2 4.3.1.5 4.2.2.3

Question	Answers	Extra information	Mark	AO / Spec Ref.
04.7		allow alternative route allow correct conversion to standard form at any stage		AO2 4.3.1.5
	$\frac{210\ 000\ 000}{2}$ **or** 105 000 000	allow $\frac{210 \text{ million}}{2}$ **or** 105 million	1	
	105 000 000 × 3	allow 105 million × 3	1	
	315 000 000	allow 315 million	1	
	3.15×10^8		1	

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Answer 02 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec Ref.
04.8	any **two** from: • wear long(er) sleeves / clothes • use insect repellent or insecticides • don't go out in the evening • avoid going to countries / places with malaria / mosquitos • destroy breeding grounds • release sterile male mosquitos	ignore vaccination / anti-malarial drugs allow reduce bare skin exposure allow insect repellent methods such as citronella candles allow close doors / windows in the evening allow methods of destroying breeding grounds such as drain water holes allow other correct suggestions	2	AO2 4.3.1.5

Question	Answers	Extra information	Mark	AO / Spec Ref.
04.9	percentage / chance (of getting malaria) decreases (with age) correct use of data such as two pairs of data from **Table 4**	do **not** accept percentage / chance of having disorder **S** decreases with age allow use of processed data	1 1	AO3 4.2.2.5 4.3.1.5

Total Question 4	15

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Answer 02 · Examiner comments

Question 4 (Low and standard demand)

04.1 Nearly two thirds of students knew the term 'vector' correctly describes the mosquito.

04.2 Although the question states that Figure 2 showed a (single) cell of a malarial protist, some students remained confused and believed that there were 'cells depicted within a cell'. Others incorrectly discussed the absence of plant cell features, such as 'no chloroplasts', while others got prokaryotic and eukaryotic cells muddled. Reference to size was ignored. While 25% of students failed to gain any marks, the most frequently seen correct feature was 'nucleus', followed by 'mitochondria'. Phonetic spellings were obviously allowed as students have difficulty in spelling both of these words. As in all questions of this nature, the 'list rule' applied so that where a student gave 3 answers, 2 of which were correct and 1 wrong, only one mark could be given.

04.3 Over two thirds of students gained the mark by selecting *Salmonella* to be prokaryotic. While the remaining students indicated 'cow' or 'grass', in equal amounts.

04.4 Around 77% of students knew that asexual reproduction involved only one parent.

04.5 It is clear that many students still remain unclear about the number of chromosomes involved in mitosis. Only around a third of students correctly selected '14' as the number of chromosomes each new protist cell would have after mitosis. The most common incorrect answer seen was '28', which was selected by a further third of the students.

04.6 Around half of students were correct in selecting 'decreased haemoglobin' as a change that would happen in the blood of a person with malaria.

04.7 Nearly 35% of students who are adept at mathematics found this question very straightforward and an easy route to four marks. A further 31% managed three marks, via many routes, but most commonly by reaching the point of 350 million but then failing to convert to standard form or incorrectly doing so. Others forgot that the question referred to 'millions' of people being infected and used 105 and 315 but, nevertheless, an answer of 3.15×10^2 was still awarded three marks.

04.8 Many students were aware of what should be done to reduce the chance of being bitten by mosquitoes but then used inadequate scientific language to express themselves and as such only around 13% of students gained both available marks. Answers such as 'cover yourself up' or 'use bug spray / repellent' were not credited. 'Wear more / thicker clothes' was also deemed insufficient and 'close windows / doors' also failed to get credit without qualifying that this was only important in the evenings. Some correctly suggested not going to places with mosquitoes or where there was an incidence of malaria and a few answers referred to destruction of breeding grounds. Other correct suggestions were also awarded credit, but overall 42% of students scored zero marks.

04.9 Nearly three quarters of students gained one mark here for correctly describing that the chance of getting malaria decreased with age. A few incorrectly understood the context of disorder S, however, and said that the likelihood of having this, rather than malaria, was lower as age increased. Even though the instruction given in the question was to use data

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Answer 02 · Examiner comments June 2023 | 8461/1F | Original Q4

from Table 4 only around 10% of students went on to gain the second mark for an appropriate use of figures. Some, unfortunately, glanced too quickly at the results and believed there was a decrease of 5% every 2 years.