AQA GCSE Biology | 8461

SPECIFICATION POINT 4.3.1.1

Communicable (infectious) diseases

Mark schemes and examiner comments

Tier	**Foundation**
Question groups	**33**
Available paper years	**2007–2025**

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.

4.3.1.1 Communicable (infectious) diseases

Answer 01 · Mark scheme January 2007 | BLY1F | Original Q4 | Legacy

Question 4

	answers	extra information	mark
(a)	antibodies antitoxins antibiotics		1 1 1
(b)	any **two** from: • measles • mumps • rubella / German measles		2
(c)	less / low / no chance of getting named / all condition(s) if vaccinated quantitative figure(s) e.g. 5 times less likely to get convulsions	must be comparative	1 1
(d)	enzymes genes		1 1
total			9

4.3.1.1 Communicable (infectious) diseases

Answer 02 · Mark scheme

June 2007 | BLY1A | Original Q8 | Legacy

Eight	**3**	**2**	**3**	**4**

Answer 03 · Mark scheme

January 2008 | BLY3F | Original Q3 | Legacy

The full source mark scheme begins on page 52. Follow original question 3 in that document.

4.3.1.1 Communicable (infectious) diseases

Answer 04 · Mark scheme June 2008 | BLY1F | Original Q5 | Legacy

question	answers	extra information	mark
5(a)(i)	antibiotic or named antibiotic	ignore antibodies accept antiseptic do **not** accept disinfectant	1
5(a)(ii)	painkillers	accept named painkillers eg aspirin	1
5(b)(i)	5.5 / 5 ½ weeks		1
5(b)(ii)	rose gains **1** mark rose, then fell then rose again gains **2** marks a further **1** marks for **one** quantitative statement eg • rose for 3 weeks / to 14–15 units • dropped to 4 weeks / 9 units • rose to 7 weeks / 64–65 units		3
5(b)(iii)	(no) level begins to fall / is falling (after 7 weeks)		1
Total			**7**

4.3.1.1 Communicable (infectious) diseases

Answer 04 · Mark scheme

June 2008 | BLY1F | Original Q5 | Legacy

COMPONENT NUMBER: BLY1F

COMPONENT NAME: Science B / Biology

STATUS: Final

DATE: June 2008

Answer 05 · Mark scheme

November 2008 | BLY1AP | Original Q9 | Legacy

Nine	**3**	**1**	**3**	**3**

4.3.1.1 Communicable (infectious) diseases

Answer 06 · Mark scheme

January 2009 | BLY1F | Original Q7 | Legacy

question	answers	extra information	mark
7(a)	antibodies	allow antitoxins / memory cells do **not** allow antigens	1
	immune	ignore protection allow resistant	1
7(b)(i)	fell		1
	numerical qualification to zero / nothing / by 100%	allow stopped in 1995	1
7(b)(ii)	(no) % vaccination fell **or** when no vaccination	ignore circle	1
	but autism numbers did not fall / stayed high / increased **or** '(yes) might support it if time lag between vaccination and autism symptoms' / 'time lag for diagnosis' (1) 6 year time lag quantified (1)		1
Total			**6**

4.3.1.1 Communicable (infectious) diseases

Answer 06 · Mark scheme January 2009 | BLY1F | Original Q7 | Legacy

COMPONENT NUMBER: BLY1F

COMPONENT NAME: Science B / Biology

STATUS: Final

DATE: January 2009

Answer 07 · Mark scheme January 2009 | BLY3F | Original Q2 | Legacy

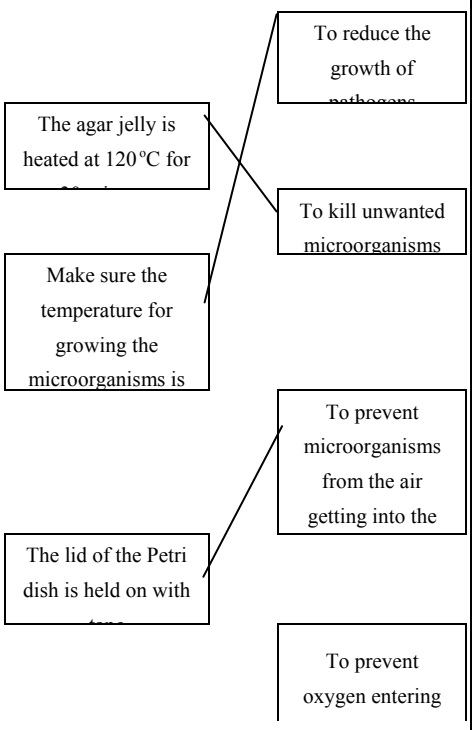
The full source mark scheme begins on page 64. Follow original question 2 in that document.

4.3.1.1 Communicable (infectious) diseases

Answer 08 · Mark scheme

June 2009 | BLY3F | Original Q3 | Legacy

Question 3

question	answers	extra information	mark
3(a)		**1** mark per correct line each extra line cancels **1** mark	3
3(b)(i)	dish 2 has (colonies of) microorganisms / bacteria / (but there are none in dish 1)	allow fungi / pathogens / microbes / germs allow more microorganisms in dish 2	1
3(b)(ii)	untreated milk contains <u>living</u> microorganisms **or** microorganisms killed by UHT **or** no <u>living</u> microorganisms in UHT milk	ignore microorganisms enter from the air	1

Question 3 continues on the next page…

4.3.1.1 Communicable (infectious) diseases

Answer 08 · Mark scheme

June 2009 | BLY3F | Original Q3 | Legacy

BLY3F

Question 3 Continued

question	answers	extra information	mark
3(b)(iii)	dish 3 was not opened **or** it was sterilised **or** nothing / no milk was added	do **not** allow no growth of microorganisms because of lack of air / oxygen ignore microorganisms cannot enter from the air	1
Total			**6**

4.3.1.1 Communicable (infectious) diseases

Answer 08 · Mark scheme June 2009 | BLY3F | Original Q3 | Legacy

BLY3F

Answer 09 · Mark scheme November 2009 | BLY1AP | Original Q3 | Legacy

No matching mark scheme was available in the supplied archive for this question.

Answer 10 · Mark scheme November 2009 | BLY1AP | Original Q7 | Legacy

No matching mark scheme was available in the supplied archive for this question.

Answer 11 · Mark scheme March 2010 | BLY1AP | Original Q8 | Legacy

Eight	**3**	**4**	**4**	**1**

Answer 12 · Mark scheme June 2010 | BLY1AP | Original Q8 | Legacy

Eight	**4**	**1**	**3**	**1**

4.3.1.1 Communicable (infectious) diseases

Answer 13 · Mark scheme

June 2010 | BLY1F | Original Q9 | Legacy

Question 9

question	answers	extra information	mark
9(a)	worldwide **or** several countries (outbreak)	ignore affects large numbers of people	1
9(b)	any **three** from • new strain of flu / virus changes / virus different • vaccination not effective **or** new vaccine not yet developed • antiviral drugs not effective / not yet developed • *people* not immune to it • virus not recognised by white blood cells / antibodies **or** antibodies / antitoxins not effective • people / animals travel between countries / abroad spreading infection	ignore mutation allow resistant / immune to vaccine allow drugs / treatment not effective do **not** allow antibiotics not effective allow people not resistant accept no antibodies / antitoxins ignore white blood cells / antibodies fighting off	*3*
Total			**4**

4.3.1.1 Communicable (infectious) diseases

Answer 14 · Mark scheme

March 2011 | BLY1AP | Original Q9 | Legacy

Nine	**4**	**2**	**1**	**4**

4.3.1.1 Communicable (infectious) diseases

Answer 15 · Mark scheme

June 2011 | BLY1F | Original Q9 | Legacy

Question 9

question	answers	extra information	mark
9	(wbc) ingest / digest pathogens / bacteria / viruses	allow eat germs ignore swallow germs ignore ingest the disease ignore attack / kill the disease	1
	(wbc) produce antibodies		1
	(wbc) produce antitoxins		1
	any **one** from:		1
	• (antibodies) destroy or kill pathogens / bacteria / viruses / germs	ignore destroy / kill disease ignore attack / fight pathogens	
	• (antitoxins) counteract / destroy / neutralise toxins / poisons	ignore attack / killing toxins	
	• reasonable reference to memory cells **or** rapid production of antibodies upon re-infection		
Total			**4**

The AQA UMS Conversion Calculator is available on the Results statistics page of the AQA Website.

4.3.1.1 Communicable (infectious) diseases

Answer 16 · Mark scheme

November 2011 | BLY1AP | Original Q2 | Legacy

Two	**A**	antibodies	**3**
	B	antibiotics	**2**
	C	toxins	**1**
	D	painkillers	**4**

4.3.1.1 Communicable (infectious) diseases

Answer 17 · Mark scheme

January 2012 | BL1FP | Original Q8 | Legacy

Question 8

question	answers	extra information	mark
8(a)	both lead to reduction / fall (in measles cases) measles vaccine caused a big drop **or** correct use of figures MMR wipes out measles **or** drops to (almost) zero **or** doesn't fall as much as measles vaccine **or** correct use of figures.	can be implied	1 1 1
8(b)	mump(s) rubella / german measles	either order allow phonetic spelling	1 1
8(c)	white blood cells (wbc) produce antibodies in future / if re-infected antibody production rapid / fast(er) / quick(er)	allow lymphocytes / leucocytes ignore memory cells ignore antitoxins / antigens / antibiotics / engulfing allow ecf from antitoxins / antigens / antibiotics ignore engulfing ignore reference to specificity	1 1 1
Total			8

UMS Conversion Calculator www.aqa.org.uk/umsconversion

4.3.1.1 Communicable (infectious) diseases

Answer 18 · Mark scheme

June 2012 | BL1FP | Original Q7 | Legacy

Question 7

question	answers	extra information	mark
7 (a)	don't kill pathogens / bacteria / viruses / microbes / microorganisms	allow don't contain antibiotics ignore antibodies / attack / fight allow only treat symptoms / pain ignore kill disease / germs	1
7 (b)	any **two** from: • age • gender • extent / severity of pain **or** how long had pain before trial • type of pain / illness / site of pain • (body) mass / weight / height • other medical issues / drugs taken / health / fitness • ethnicity	accept 'the pain' for **1** mark, if neither extent or type given ignore pain threshold allow body size / physique	2
7 (c)(i)	75	ignore calculations / %	1
7 (c)(ii)	faster pain relief / decrease	allow pain relief sooner **or** it works quicker **or** more pain relief at start / in first 1 / $1\frac{3}{4}$ hours	1
7 (c)(iii)	decrease of pain higher / more decrease of pain is longer lasting	ignore more effective unless qualified by time >$1\frac{3}{4}$ hours allow effect lasts longer	1 1

Question 7 continues on the next page . . .

4.3.1.1 Communicable (infectious) diseases

BL1FP

Question 7 continued

question	answers	extra information	mark
7 (d)	any **three** from: **(Yes because)** • rapid pain relief (from A) • long lasting pain relief (from B) • and it costs less • the sum of the pain relief (from A + B) is greater (than X) **(No because)** • drug X gives more pain relief • (A + B / they) might interact with each other • could result in overdose • could be more / new side effects	ignore yes or no if neither points gained allow (more) dangerous	3
Total			**10**

4.3.1.1 Communicable (infectious) diseases

Answer 18 · Mark scheme

June 2012 | BL1FP | Original Q7 | Legacy

BL1FP

4.3.1.1 Communicable (infectious) diseases

Answer 19 · Mark scheme January 2013 | BL1FP | Original Q3 | Legacy

Question 3

question	answers	extra information	mark
3(a)	pathogens		1
3(b)(i)	A disease affecting people in many countries		1
3(b)(ii)	birds fly / migrate OR human contact with birds more likely OR there are more birds (than pigs)	accept converse birds not contained / difficult to control movement	1
3(c)(i)	antibiotics (only) kill bacteria OR antibiotics don't kill viruses	ignore flu is caused by a virus unqualified ignore virus resistant / immune	1
3(c)(ii)	painkillers	accept any correct named painkiller, eg aspirin or paracetamol allow antivirals / Tamiflu ignore medicine / tablets	1
3(c)(iii)	resistant bacteria	in this order	1 1
Total			7

4.3.1.1 Communicable (infectious) diseases

Answer 19 · Mark scheme

January 2013 | BL1FP | Original Q3 | Legacy

BL1FP

4.3.1.1 Communicable (infectious) diseases

Answer 20 · Mark scheme

Question 3

question	answers	extra information	Mark
3(a)(i)	25 °C		1
3(a)(ii)	pathogens		1
3(b)	**D** more / most bacteria killed	 accept biggest area / ring where no bacteria are growing	1 1
3(c)	viruses live inside cells		1
Total			**5**

4.3.1.1 Communicable (infectious) diseases

Answer 21 · Mark scheme

June 2013 | BL1FP | Original Q7 | Legacy

Question 7

question	answers	extra information	Mark
7(a)(i)	lower percentage (of women) who died numerical reference to a pair of figures to show this	allow fewer (women) died allow any difference in a pair of figures	1 1
7(a)(ii)	doctors were not transferring pathogens / bacteria / viruses / microorganisms / microbes	ignore reference to nurses allow fungi ignore disease / germs / infection	1 1
7(b)	any **three** from: • lower percentage of patients died (when doctors washed hands or in ward A) • large decrease or reference to proportional decrease • little / no difference / similar to ward B • continued drop (in ward A)	 allow fewer for lower percentage ignore raw data	3
7(c)	any **two** from: • better understanding / knowledge of immunity • better / new drugs • sterilisation of equipment **or** isolation of patients **or** some infectious diseases wiped out **or** earlier identification / treatment of infections	 accept ref to immunisation / vaccination accept examples, e.g. antibiotics / penicillin (discovered) allow better / new medicines ignore references to general hygiene	2
Total			**9**

4.3.1.1 Communicable (infectious) diseases

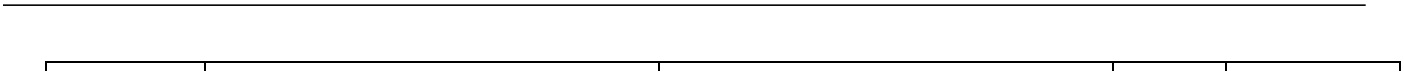
Answer 22 · Mark scheme June 2015 | BL1FP | Original Q2 | Legacy

Question	Answers	Extra information	Mark	AO / Spec. Ref.
2(a)(i)	64		1	AO2 1.1
2(a)(ii)	36	allow e.c.f from (a)(i) i.e. 100 – answer given in (a)(i)	1	AO2 1.1
2(a)(iii)	any **one** from: • only considers 16-year-olds • only about some / 5 countries	ignore lack of evidence allow does not refer to all ages allow does not refer to all countries	1	AO3 1.1
2(b)	the more exercise done the healthier a person is	allow the more exercise done the higher the health rating allow the less exercise done the lower the health rating	1	AO3 1.1.1e
2(c)	having a high cholesterol level		1	AO1 1.1.1d
2(d)(i)	antibodies		1	AO1 1.1.2c/d/e
2(d)(ii)	antibiotics		1	AO1 1.1.2i
Total			**7**	

4.3.1.1 Communicable (infectious) diseases

Answer 22 · Mark scheme

June 2015 | BL1FP | Original Q2 | Legacy



4.3.1.1 Communicable (infectious) diseases

Answer 23 · Mark scheme June 2016 | BL1FP | Original Q5 | Legacy

Question	Answers	Extra information	Mark	AO / Spec. Ref.
5(a)(i)	hand-washing		1	AO1 1.1.2f
5(a)(ii)	small amounts of dead pathogens		1	AO1 1.1.2l
5(a)(iii)	decrease by 60 (%)	 allow from 70(%) to 10(%) allow other correct data treatment	1 1	AO2 1.1.2
5(b)(i)	penicillin		1	AO1 1.1.2h
5(b)(ii)	any **two** from: • antibiotics only kill bacteria • some bacteria are resistant (to antibiotics) • (correct) antibiotics not always used • deficiency disease(s) not caused by bacteria **or** cannot be treated by antibiotics • inherited disease(s) not caused by bacteria **or** cannot be treated by antibiotics • 'lifestyle' diseases not caused by bacteria **or** cannot be treated by antibiotics	 allow antibiotics do not kill viruses allow MRSA not killed by antibiotics allow course not completed eg heart disease / cancer if no other mark given allow **1** mark for not all diseases are caused by bacteria **or** some diseases are caused by viruses	2	AO2 / AO3 1.1.2h/i/j/k 1.1.1a/d
5(c)	bacteria grow faster	allow this is body temp (at which pathogens grow)	1	AO1 1.1.2o
Total			**8**	

4.3.1.1 Communicable (infectious) diseases

Answer 23 · Mark scheme

June 2016 | BL1FP | Original Q5 | Legacy

4.3.1.1 Communicable (infectious) diseases

Answer 24 · Mark scheme June 2017 | BL1FP | Original Q5 | Legacy

Question	Answers	Extra information	Mark	AO / Spec. Ref.
5(a)		reason must be consistent with safety precaution mark together		AO2 1.1.2m
		ignore germs		
		ignore other safety precautions		
		do **not** allow viruses		
	either			
	Petri dish / culture medium sterile	allow agar sterile	1	
	so no other / harmful microorganisms grow		1	
	OR			
	Petri dish / lid secured (with adhesive tape) (1)			
	so microorganisms cannot leave (1)	allow so other / harmful microorganisms cannot enter ignore spread unqualified		
	OR			
	incubated at 25 °C (1)			
	to prevent / reduce growth of pathogens (1)			
5(b)(i)	any **one** from: • largest / larger area where no microorganisms are growing • most / more microorganisms killed	allow largest clear / white area	1	AO3 1.1.2h/i/j

4.3.1.1 Communicable (infectious) diseases

Answer 24 · Mark scheme

5(b)(ii)	*idea of* E may not be best on all / other (types of) microorganism eg tested on only one type of microorganism	allow antibiotics do not kill viruses allow (other) bacteria / microorganisms may be / become resistant (to E) allow deficiency diseases are not caused by microorganisms allow disease may be minor / not life threatening allow only tested once **or** not repeated allow (patient) may be allergic to E allow idea of investigation not carried out at body temperature	1	AO3 1.1.2h/i/j 1.1.1a
5(c)(i)	B **and** C **and** D	all three required in any order for mark additional letters will cancel the mark	1	AO2 1.1.2

4.3.1.1 Communicable (infectious) diseases

Answer 24 · Mark scheme

5(c)(ii)	Healthy animals will produce a higher yield.		1	AO3 1.1.2
5(c)(iii)	Microorganisms become resistant to the antibiotic.		1	AO1 1.1.2h/i
5(d)(i)	white	allow phagocytes / lymphocytes / leucocytes do **not** allow other types of blood cell	1	AO1 1.1.2c/d
5(d)(ii)	These blood cells produce antibodies. These blood cells ingest pathogens.		1 1	AO1 1.1.2d
Total			**10**	

4.3.1.1 Communicable (infectious) diseases

Answer 24 · Mark scheme

June 2017 | BL1FP | Original Q5 | Legacy

4.3.1.1 Communicable (infectious) diseases

Answer 25 · Mark scheme June 2018 | 8461/1F | Original Q5

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.1	phloem		1	AO2 4.2.3.2
05.2	translocation		1	AO1 4.2.3.2
05.3	either: less (sugars for) respiration (so) less energy released **or** less amino acids made (1) (so) less protein produced **or** less protein synthesis (1) **or** less cellulose made (1) (so) weaker cell walls (1)		 1 1	AO2 4.4.1.3 4.4.2.1
05.4	(aphids) can fly to another plant **or** part of the plant to get (more) food	ignore to fly unqualified allow to find a mate allow idea of less competition for food allow to escape predators do **not** accept escape prey	1 1	AO2 4.3.3.1
05.5	(oil) prevents aphids from attaching to leaf **or** causes aphids to slide off leaf **or** idea that oil may harm / kill the aphid	ignore 'the leaf is slippery' allow oil may be unpleasant to the aphid	1	AO2 4.3.3.2

4.3.1.1 Communicable (infectious) diseases

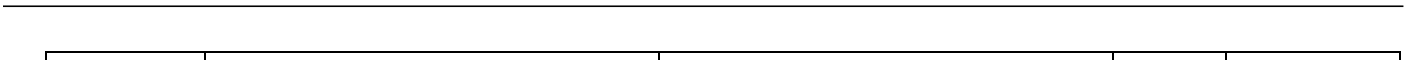
Answer 25 · Mark scheme June 2018 | 8461/1F | Original Q5

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.6	(plant / stem has) thorns	allow spines / spikes / prickles ignore stings do **not** accept thorns protect (the plant) from predators	1	AO1 4.3.3.2
05.7	C (fungi / spores) blown by / in direction of the wind **or** it's the closest plant (to A)	if any other letter given then no marks for the question allow black spot / disease is blown by / in direction of the wind do **not** accept reference to bacteria / viruses / pollen being blown	1 1	AO3 4.3.1.4 4.3.3.1 AO2 4.3.1.4 4.3.3.1
05.8	any **one** from: • spread rose bushes out more • remove any infected parts of the plant • use a fungicide	allow isolate the infected plant allow idea of barrier around infected plant ignore separate unless qualified allow remove infected plant / A ignore pesticide do **not** accept insecticides / herbicide	1	AO2 4.3.1.4 4.3.3.1
Total			**11**	

4.3.1.1 Communicable (infectious) diseases

Answer 25 · Mark scheme

June 2018 | 8461/1F | Original Q5



4.3.1.1 Communicable (infectious) diseases

Answer 26 · 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

4.3.1.1 Communicable (infectious) diseases

Answer 26 · 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		

4.3.1.1 Communicable (infectious) diseases

Answer 26 · 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**	

4.3.1.1 Communicable (infectious) diseases

Answer 26 · Mark scheme

June 2019 | 8461/1F | Original Q8

Question	Answers	Extra information	Mark	AO / Spec. Ref.

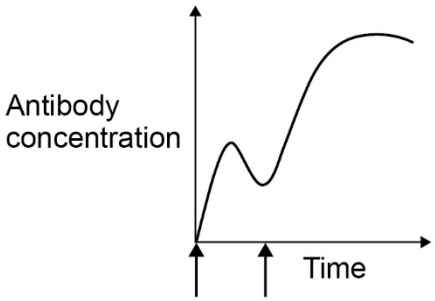
Answer 27 · Mark scheme

November 2020 | 8461/1F | Original Q3

The full source mark scheme begins on page 77. Follow original question 3 in that document.

4.3.1.1 Communicable (infectious) diseases

Answer 28 · Mark scheme November 2021 | 8461/1F | Original Q2

02.1	pathogens		1	AO1 4.3.1.1
02.2	viruses reproduce inside cells, damaging them		1	AO1 4.3.1.1
02.3	any **one** from: • they do not have a cell membrane • they do not have cytoplasm • they do not have a nucleus • they do not have mitochondria (like most eukaryotic cells) • they do not have ribosomes	do **not** accept they do not have a cell wall do **not** accept they do not have chloroplasts / chlorophyll ignore they are not living / alive ignore they can only replicate inside cells ignore virus has a protein coat	1	AO2 4.1.1.2
02.4	a weakened form of a virus		1	AO1 4.3.1.7
02.5			1	AO2 4.3.1.7
02.6	leaf		1	AO1 4.3.1.2

4.3.1.1 Communicable (infectious) diseases

Answer 28 · Mark scheme

November 2021 | 8461/1F | Original Q2

02.7	y-axis labelled rate of photosynthesis in arbitrary units correct scale all bars plotted correctly all bars correctly labelled	 allow a tolerance of ± ½ small square allow 2 correct bars for **1** mark allow bars touching allow any width of bars ignore letters	1 1 2 1	AO2 4.4.1.1
02.8	as the level of infection (with TMV) increases, (the rate of) photosynthesis decreases	allow as TMV increases, photosynthesis decreases allow (the rate of) photosynthesis decreases as the level of infection (with TMV) increases allow as infection gets worse, photosynthesis decreases allow TMV reduces photosynthesis	1	AO3 4.4.1.1
02.9	less chlorophyll (so) less glucose / starch / protein made	allow fewer chloroplasts allow less light absorbed ignore less photosynthesis	1 1	AO2 4.4.1.1 4.4.1.3 4.3.1.2
Total			**14**	

4.3.1.1 Communicable (infectious) diseases

Answer 28 · Mark scheme

November 2021 | 8461/1F | Original Q2

Question	Answers	Extra information	Mark	AO / Spec. Ref.

4.3.1.1 Communicable (infectious) diseases

Answer 29 · Mark scheme

June 2022 | 8461/1F | Original Q1

Question 1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.1	sexual intercourse		1	AO1 4.3.1.1 4.3.1.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.2	increased (at first) (then) decreased	ignore numbers unqualified do **not** accept an implication of an overall increase if no other mark awarded allow (overall) decrease for **1** mark	1 1	AO3 4.3.1.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.3	better education on how to prevent the spread of HIV		1	AO3 4.3.1.1 4.3.1.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.4	(C) → E → A → B → D	allow **1** mark for E → A link allow **1** mark for A → B link allow **1** mark for B → D link if no other mark awarded allow **1** mark for an answer of (C) → E → B → A → D	3	AO1 4.3.1.1 4.3.1.6 4.3.1.7 4.3.1.2

4.3.1.1 Communicable (infectious) diseases

Answer 29 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.5	testing on healthy volunteers		1	AO1 4.3.1.9

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.6	drugs that destroy viruses also damage body tissues		1	AO1 4.3.1.8

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.7	**Drug** / **Plant the drug originated from** Aspirin → Willow Digitalis → Foxglove do **not** accept more than one line from a box on the left		1 1	AO1 4.3.1.1 4.3.1.9

Total Question 1		11

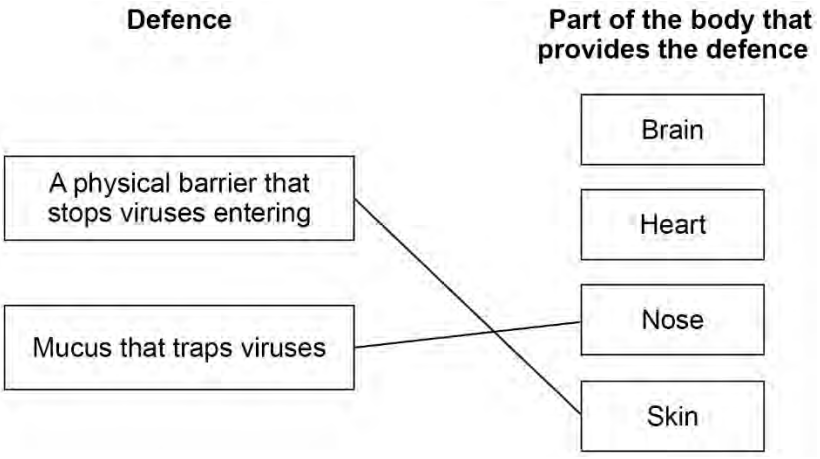
4.3.1.1 Communicable (infectious) diseases

Answer 30 · Mark scheme

June 2023 | 8461/1F | Original Q2

Question 2

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.1	pathogens		1	AO1 4.3.1.1

Question	Answers	Mark	AO / Spec Ref.
02.2	 do **not** accept more than one line from a box on the left	1 1	AO1 4.3.1.6

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.3	division		1	AO1 4.2.2.7

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.4	malignant tumours have cells that can spread to other parts of the body malignant tumours may form secondary tumours		1 1	AO1 4.2.2.7

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.5	(percentage) decreases		1	AO3 4.2.2.7 4.2.2.5

4.3.1.1 Communicable (infectious) diseases

Answer 30 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.6	more females were vaccinated (over time)	allow males may also be vaccinated allow more people were vaccinated allow increased use of (named) barrier methods of contraception allow more awareness / education (about HPV)	1	AO3 4.2.2.7 4.2.2.5

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.7	white blood cells		1	AO1 4.3.1.7

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.8	antibodies		1	AO1 4.3.1.7 4.3.1.6

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.9	any **one** from: • people are afraid of side / unknown effects • religious / cultural objections • (some people) believe they don't work • some people think (HPV) vaccine encourages sexual activity	ignore pain of injection allow there are side effects allow people think they cause (named) disease ignore religion unqualified ignore moral / ethical objections	1	AO3 4.3.1.7

Total Question 2	11

4.3.1.1 Communicable (infectious) diseases

Answer 31 · Mark scheme

June 2024 | 8461/1F | Original Q2

Question 2

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.1	(physical) barrier **or** stops pathogens entering (blood / body)	allow named pathogen throughout allow produces antimicrobial secretions allow produces oil / sebum / sweat ignore reference to scabs / clots	1	AO1 4.3.1.6

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.2	$\frac{63}{210}$ $\frac{3}{10}$	 allow 0.3 ignore 30% if neither mark awarded allow $\frac{210}{63} = \frac{10}{3}$ for **1** mark	1 1	AO2 4.3.1.6 4.2.2.1

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.3	*(at pH1)* 187 (killed) *(at pH5)* 31 (killed) (187 – 31) = 156 (more bacteria killed)	ignore negative symbol throughout allow correct subtraction using incorrect calculation at pH1 and/or pH5	1 1 1	AO2 4.3.1.6 4.2.2.1

4.3.1.1 Communicable (infectious) diseases

Answer 31 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.4	(the student) calculated the midpoint (between) 23 and 63 **OR** any **two** from: • $\frac{63 - 23}{2} = 20$ • 20 + 23 = 43 • 63 – 20 = 43	 allow (between values at) pH1 and pH3 allow $\frac{23 + 63}{2} = 43$ for **2** marks allow plot data from **Table 1** on graph (1) then read off value for pH2 (1) allow other correct methods for up to **2** marks	1 1	AO3 4.3.1.6 4.2.2.1

Total Question 2	8

4.3.1.1 Communicable (infectious) diseases

Answer 32 · Mark scheme

June 2025 | 8461/1F | Original Q3

Question 3

Question	Answers	Extra information	Mark	AO / Spec Ref.
03.1	pathogens	in this order only	1	AO1 4.3.1.1
	antitoxins		1	AO1 4.3.1.6 4.2.2.3

Question	Answers	Extra information	Mark	AO / Spec Ref.
03.2	*measurement* 60 (mm)	allow measurement in the range 59 (mm) to 61 (mm)	1	AO2 4.1.1.5
	conversion 60 000 (µm)	allow correct conversion from incorrect measurement	1	
	substitution $= \frac{60\ 000}{4\ 000}$	allow correct substitution using incorrect conversion	1	
	real width 15 (µm)	allow correct calculation using incorrectly converted value	1	

Question	Answers	Extra information	Mark	AO / Spec Ref.
03.3	capillary		1	AO3 4.2.2.2 4.2.2.3

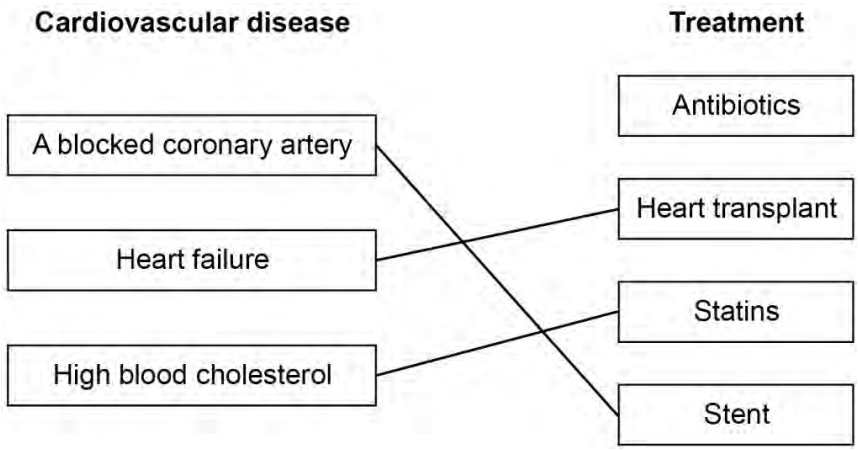
Question	Answers	Extra information	Mark	AO / Spec Ref.
03.4	(blood in arteries) has high pressure		1	AO3 4.2.2.2
	(so need thick walls) to withstand / maintain the pressure **or** (so need thick walls) to prevent bursting	ignore to increase the pressure allow **2** marks for to withstand / maintain high pressure	1	

4.3.1.1 Communicable (infectious) diseases

Answer 32 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec Ref.
03.5	deposits / build-up / increase of fat(ty material)	allow deposits / build-up / increase of cholesterol allow deposits / build-up / increase of plaque	1	AO1 4.2.2.4

Question	Answers	Extra information	Mark	AO / Spec Ref.
03.6	less / no blood flow (so) less / no oxygen / glucose transported (to heart / body)	 allow **2** marks for less oxygenated blood flows if no other marks awarded allow **1** mark for idea that it will lead to a heart attack	1 1	AO1 4.2.2.4

Question	Answers	Mark	AO / Spec Ref.
03.7	 do **not** accept more than one line from a box on the left	1 1 1	AO1 4.2.2.4

Question	Answers	Extra information	Mark	AO / Spec Ref.
03.8	because it cannot be spread / passed on (from one person to another) **or** because it is not caused by a pathogen / bacterium / virus / fungus / protist / microorganism / microbe	allow not contagious / infectious ignore because it is a lifestyle disease	1	AO2 4.2.2.4

Total Question 3	16

4.3.1.1 Communicable (infectious) diseases

Answer 33 · Mark scheme

June 2025 | 8461/1F | Original Q6

Question 6

Question	Answers	Extra information	Mark	AO / Spec Ref.
06.1	virus		1	AO1 4.3.1.2

Question	Answers	Extra information	Mark	AO / Spec Ref.
06.2	any **one** from: • (transfer of) droplets / saliva / mucus • sneezes • coughs	ignore other methods of transferring pathogens, unqualified such as touch or direct contact do **not** accept transfer through sexual intercourse	1	AO1 4.3.1.2

Question	Answers	Extra information	Mark	AO / Spec Ref.
06.3	willow	ignore parts of willow such as bark / leaves	1	AO1 4.3.1.9

Question	Answers	Extra information	Mark	AO / Spec Ref.
06.4	fever **or** (red skin) rash	allow high temperature allow (increased) sweating allow (red) spots / lumps / boils allow red / itchy skin allow cough / sneeze allow runny / blocked nose allow sore throat allow red / watery / sore eyes allow headache ignore flu-like symptoms, unqualified ignore pain unqualified do **not** accept nausea / diarrhoea	1	AO1 4.3.1.2

4.3.1.1 Communicable (infectious) diseases

Answer 33 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec Ref.
06.5	**few(er)** people (in population) with pathogen / measles / disease (due to vaccination) (so) **less likely** for pathogen / measles / disease to be passed on **or** (so) **less likely** for pathogen / measles / disease to be spread / caught	allow named types of pathogen allow (provides) herd immunity allow **less likely** to come into contact with a person with pathogen / measles / disease ignore (so) spread of disease is reduced allow **2** marks for fewer people with measles, so **less likely** to spread	1 1	AO2 4.3.1.2 4.3.1.7

Question	Answers	Extra information	Mark	AO / Spec Ref.
06.6	(graph reading) = 45 $\frac{45}{100} \times 240$ 108	 allow 0.45 × 240 allow for **1** mark an answer of 7 / 7.2 with evidence of having used 3(%) from **Figure 9** **or** allow for **1** mark an answer of 88 / 88.8 / 89 with evidence of having used 37(%) from **Figure 9**	1 1 1	AO2 4.3.1.2

4.3.1.1 Communicable (infectious) diseases

Answer 33 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec Ref.
06.7		allow answers in terms of numbers of children or likelihood of getting disease		AO3 4.3.1.2
	a lower percentage of vaccinated children have severe measles / infection / disease **or** a higher percentage of unvaccinated children have severe measles / infection / disease **or** vaccination reduces severity of measles / infection / disease	allow converse	1	
	correct use of supporting comparative data from **Figure 9**	allow examples such as (severe disease is) 42% higher (in unvaccinated) **or** 15 times higher (than in vaccinated) **or** allow correct use of raw data used in a comparative way	1	

Total Question 6	11

Version 1.0: 0108

ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Secondary Education

Biology 4411

BLY3F Unit 3 Biology

Mark Scheme

2008 examination – January series

4.3.1.1 Communicable (infectious) diseases

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Further copies of this Mark Scheme are available to download from the AQA Website: www.aqa.org.uk

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4.3.1.1 Communicable (infectious) diseases

MARK SCHEME

Information to Examiners

1. General

The mark scheme for each question shows:

- the marks available for each part of the question
- the total marks available for the question
- the typical answer or answers which are expected
- extra information to help the Examiner make his or her judgement and help to delineate what is acceptable or not worthy of credit or, in discursive answers, to give an overview of the area in which a mark or marks may be awarded.

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In general the right hand side of the mark scheme is there to provide those extra details which confuse the main part of the mark scheme yet may be helpful in ensuring that marking is straightforward and consistent.

2. Emboldening

2.1 In a list of acceptable answers where more than one mark is available 'any **two** from' is used, with the number of marks emboldened. Each of the following lines is a potential mark.

2.2 A bold **and** is used to indicate that both parts of the answer are required to award the mark.

2.3 Alternative answers acceptable for a mark are indicated by the use of **or**. (Different terms in the mark scheme are shown by a / ; eg allow smooth / free movement.)

3. Marking points

3.1 Marking of lists

This applies to questions requiring a set number of responses, but for which candidates have provided extra responses. The general principle to be followed in such a situation is that 'right + wrong = wrong'.

Each error/contradiction negates each correct response. So, if the number of error/contradictions equals or exceeds the number of marks available for the question, no marks can be awarded.

However, responses considered to be neutral (indicated as * in example 1) are not penalised.

4.3.1.1 Communicable (infectious) diseases

Example 1: What is the pH of an acidic solution? (1 mark)

Candidate	Response	Marks awarded
1	4,8	0
2	green, 5	0
3	red*, 5	1
4	red*, 8	0

Example 2: Name two planets in the solar system. (2 marks)

Candidate	Response	Marks awarded
1	Pluto, Mars, Moon	1
2	Pluto, Sun, Mars, Moon	0

3.2 Use of chemical symbols / formulae

If a candidate writes a chemical symbol / formula instead of a required chemical name, full credit can be given if the symbol / formula is correct and if, in the context of the question, such action is appropriate.

3.3 Marking procedure for calculations

Full marks can be given for a correct numerical answer, as shown in the column 'answers', without any working shown.

However if the answer is incorrect, mark(s) can be gained by correct substitution / working and this is shown in the 'extra information' column;

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Answers using the word 'it' should be given credit only if it is clear that the 'it' refers to the correct subject.

3.5 Errors carried forward

Any error in the answers to a structured question should be penalised once only.

Papers should be constructed in such a way that the number of times errors can be carried forward are kept to a minimum. Allowances for errors carried forward are most likely to be restricted to calculation questions and should be shown by the abbreviation e.c.f. in the marking scheme.

3.6 Phonetic spelling

The phonetic spelling of correct scientific terminology should be credited **unless** there is a possible confusion with another technical term.

3.7 Brackets

(…..) are used to indicate information which is not essential for the mark to be awarded but is included to help the examiner identify the sense of the answer required.

3.8 Unexpected Correct Answers not in the Mark Scheme

The Examiner should use professional judgement to award credit where a candidate has given an unexpected correct answer which is not covered by the mark scheme. The Examiner should consult with the Team Leader to confirm the judgement. The Team Leader should pass this answer on to the Principal Examiner with a view to informing all examiners.

4.3.1.1 Communicable (infectious) diseases

BLY3F

Question 1

question	answers	extra information	mark
(a)	B = rib C = diaphragm		1 1
(b)(i)	D	allow lower case	1
(b)(ii)	carbon dioxide		1
total			4

BLY3F

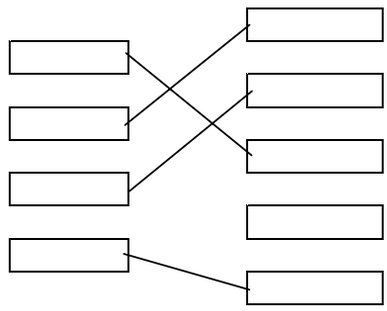
Question 2

question	answers	extra information	mark
(a)(i)	A **or** C	allow lower case	1
(a)(ii)	B **or** D	allow lower case	1
(b)(i)	60		1
(b)(ii)	4		1
(c)	red blood cells		1
total			5

4.3.1.1 Communicable (infectious) diseases

BLY3F

Question 3

question	answers	extra information	mark
		**1** mark for each line extra line from List A Action cancels the mark	4
total			4

4.3.1.1 Communicable (infectious) diseases

BLY3F

Question 4

question	answers	extra information	mark
(a)(i)	<u>on diagram:</u> arrow drawn from cell **X**, through air space and out through stoma above stoma		1
(a)(ii)	transpiration		1
(b)(i)	13 – 15	ignore units	1
(b)(ii)	any **two** from: • warmest / hottest / brightest time of day • water evaporates fastest • stomata open / more open	accept warmer / hotter **or** sun higher in sky	2
total			5

4.3.1.1 Communicable (infectious) diseases

BLY3F

Question 5

question	answers	extra information	mark
(a)(i)	increased / thick(er)	allow more / wide(r) / broad	1
(a)(ii)	decreased		1
(b)	1	IGNORE working or lack of working correct figures from table 2.1 and 1.1 but no answer / wrong answer = **1** mark	2
total			4

4.3.1.1 Communicable (infectious) diseases

BLY3F

Question 6

question	answers	extra information	mark
(a)(i)	bladder		1
(a)(ii)	glucose protein	extras – CANCEL	1 1
(b)(i)	any **two** from: • kidney functions all the time / not just 3 × 8 h sessions a week • can eat high-protein foods / high salt foods • cheaper • waste of time	allow direct quotation of correct points from the list allow can eat anything	2
(b)(ii)	have to take (immunosuppressant) drugs / consequence of this eg catch infections / may suffer brain damage / possible rejection of kidney **or** become ill more easily **or** risk of brain damage (due to anaesthetic)	allow direct quotation of correct points from the list	1
(c)(i)	urea		1
(c)(ii)	4.2		1
total			8

4.3.1.1 Communicable (infectious) diseases

BLY3F

Question 7

question	answers	extra information	mark
(a)	0.62 to 0.64	ignore working or lack of working correct figures from graph 8.4 and 2.2 but no answer / wrong answer gains **1** mark **or** wrong figures from graph subtracted and divided by 10 gains **1** mark **or** answer 0.61 gains **1** mark	2
(b)	(oxygen for) <u>aerobic</u> respiration <u>more</u> energy available owtte **or** no / less harmful products **or** no ethanol / alcohol	 allow more energy produced / created / made allow converse ignore more efficient	1 1
total			4

4.3.1.1 Communicable (infectious) diseases

BLY3F

Question 8

question	answers	extra information	mark
(a)	to kill (micro)organisms / bacteria / named organism **or** to sterilise	allow germs ignore remove / get rid of	1
(a)(ii)	(room temperature is) suitable / best for growth / reproduction of microorganisms **or** suitable / best for enzymes	accept converse allow germs allow grow / culture (at room temperature) ignore not killed / live	1
(a)(iii)	to prevent entry of microorganisms owtte	apply list principle allow germs ignore dust / dirt	1
(b)	yes (no mark) microorganisms / bacteria could (only) enter B **or** microoorganisms / bacteria etc cannot enter flask A living organisms / bacteria / etc only develop from pre-existing organisms / bacteria owtte eg 'life from life' **or** reference to reproduction	can be implied allow do not spontaneously generate eg they can only grow if they can get in gains **2** marks	 1 1
total			5

4.3.1.1 Communicable (infectious) diseases

BLY3F

Question 9

question	answers	extra information	mark
(a)(i)	methane	apply list principle allow symbols	1
(a)(ii)	anaerobic respiration / (anaerobic) fermentation	ignore decay / decomposition etc	1
(b)(i)	any **two** from: • manure disposed of • gains fertiliser (for crops) • gets (free) fuel **or** cheap supply of energy **or** (free) cooking / heating / lighting • can sell crops at higher price	 allow converse allow not using wood / trees	2
(b)(ii)	in the UK lower temperature **or** not enough heat process is slower **or** enzymes action slower	allow converse arguments for Sri Lanka ignore other factor(s) ignore references to efficiency / 'bacteria working'	 1 1
total			6

4.3.1.1 Communicable (infectious) diseases

Version 1: 0109

ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Secondary Education

Biology 4411

BLY3F Unit Biology 3

Mark Scheme

2009 examination – January series

4.3.1.1 Communicable (infectious) diseases

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4.3.1.1 Communicable (infectious) diseases

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4.3.1.1 Communicable (infectious) diseases

COMPONENT NUMBER: BLY3F

COMPONENT NAME: Biology

STATUS: Final

DATE: January 2009

question	answers	extra information	mark
1(a)(i)	artery		1
1(a)(ii)	capillary		1
1(b)	alveoli		1
	red blood cells		1
	nucleus		1
Total			**5**

4.3.1.1 Communicable (infectious) diseases

COMPONENT NUMBER: BLY3F

COMPONENT NAME: Biology

STATUS: Final

DATE: January 2009

question	answers	extra information	mark
2(a)(i)	energy		1
2(a)(ii)	microorganisms		1
2(b)(i)	25°C		1
2(b)(ii)	pathogens		1
Total			**4**

4.3.1.1 Communicable (infectious) diseases

COMPONENT NUMBER: BLY3F

COMPONENT NAME: Biology

STATUS: Final

DATE: January 2009

<table>
<tr><th>question</th><th>answers</th><th>extra information</th><th>mark</th></tr>
<tr><td>3(a)</td><td>178</td><td>ignore working or lack of working

correct working: 180 – 2 but no answer / wrong answer = 1 mark</td><td>2</td></tr>
<tr><td>3(b)</td><td><table><tr><th>Man A</th><th>Man B</th></tr><tr><td>higher</td><td>lower</td></tr><tr><td>lower</td><td>higher</td></tr><tr><td>lower</td><td>higher</td></tr></table></td><td>all 4 cells correct = 2 marks
2 or 3 cells correct = 1 mark
0 or 1 cells correct = 0 mark</td><td>2</td></tr>
<tr><td>Total</td><td></td><td></td><td>4</td></tr>
</table>

4.3.1.1 Communicable (infectious) diseases

COMPONENT NUMBER: BLY3F

COMPONENT NAME: Biology

STATUS: Final

DATE: January 2009

question	answers	extra information	mark
4(a)	yeast		1
4(b)(i)	**two** sensible suggestions, each linked to correct explanation:	max **4** marks	
	does not release CO		1
	gas is toxic / harms living organisms		1
		allow ethanol <u>only</u> releases CO_2 and H_2O for **1** mark	
	does not release NO_x / SO_2	do **not** allow more pollution / more gases released	1
	gas(es) cause acid rain / eq / harms organisms		1
	or		
	does not cause acid rain (1)		
	(acid rain) damages building / harms organisms (1)		
	made from crops / not a fossil fuel (1)		
	crops can re-grow / source is renewable / fossil fuels are non-renewable (1)		
4(b)(ii)	any **one** from • releases less energy (per litre) • need to burn more to cover same distance / travel shorter distance • land not being used for food crops / less food available • raises food prices		1
Total			**6**

4.3.1.1 Communicable (infectious) diseases

COMPONENT NUMBER: BLY3F

COMPONENT NAME: Biology

STATUS: Final

DATE: January 2009

question	answers	extra information	mark
5(a)	40–60 hours		1
5(b)(i)	decrease 1st slowly then faster / appropriate detail from the graph eg from 7.8 to 0 / faster after 4-10 h		1 1
5(b)(ii)	oxygen after glucose oxygen less than glucose	extra box ticked cancels **1** mark	1 1
5(b)(iii)	aerobic respiration		1
Total			**6**

4.3.1.1 Communicable (infectious) diseases

COMPONENT NUMBER: BLY3F

COMPONENT NAME: Biology

STATUS: Final

DATE: January 2009

question	answers	extra information	mark
6(a)(i)	kill / destroys (micro)organisms / bacteria / fungi / living things	do **not** allow get rid of microorganisms	1
6(a)(ii)	entered from environment / already in flask **or** insufficient heating to kill all microorganisms		1
6(b)	any **two** from: • heated more thoroughly / for longer / higher temperature • destroyed / killed all microorganisms • sealed better eg flask melted / sealed immediately after heating / no pouring through air • microorganisms unable to enter (from air) / can only enter when neck broken / open		2
6(c)	biogenesis		1
Total			**5**

4.3.1.1 Communicable (infectious) diseases

COMPONENT NUMBER: BLY3F

COMPONENT NAME: Biology

STATUS: Final

DATE: January 2009

question	answers	extra information	mark
7(a)(i)	19 800	for correct answer ignore working or lack of working 165 × 120 but no answer / wrong answer = **1** mark (ignore extras)	2
7(a)(ii)	any **two** from: • for respiration • energy released • prevents anaerobic respiration • prevents build-up of lactic acid	 ignore oxygen debt allow energy produced	2
7(b)	any **two** from: • increased breathing rate • increased depth of breathing **or** deep breathing • dilation of arteries / vasodilation • blood diverted from elsewhere	 } more breathing is max **1** mark ignore increase in heart rate allow heavier breathing do **not** allow harder breathing allow blood vessels dilate do **not** allow veins / capillaries dilate ignore name of organ	2
Total			**6**

4.3.1.1 Communicable (infectious) diseases

COMPONENT NUMBER: BLY3F

COMPONENT NAME: Biology

STATUS: Final

DATE: January 2009

question	answers	extra information	mark
8(a)	transpiration / evaporation / diffusion	ignore osmosis	1
8(b)(i)	D		1
8(b)(ii)	any **two** from: • more / faster diffusion **or** evaporation **or** transpiration • molecules move faster • maintains concentration gradient **or** keeps water concentration low in the air **or** brings in more dry air **or** removes damp air / water		2
Total			**4**

4.3.1.1 Communicable (infectious) diseases

COMPONENT NUMBER: BLY3F

COMPONENT NAME: Biology

STATUS: Final

DATE: January 2009

question	answers	extra information	mark
9(a)	prevents denaturation / change / damage of proteins / enzymes **or** prevents bacteria being killed / destroyed	allow protein is 'destroyed' do **not** allow 'bacteria denatured' **or** 'protein killed'	1
9(b)(i)	any **two** from: • anaerobic respiration • lactic (production) • acid (produced)	do **not** allow 'bacteria are acidic' allow max **1** mark if incorrect named acid	2
9(b)(ii)	any **one** from: • thickens / clots / solidifies (milk) • kills other microorganisms **or** prevents other microbes growing • preserves yoghurt **or** prevents yoghurt going off **or** makes yoghurt last longer **or** keeps it fresh • reference to (improved) flavour	allow reference to germs	1
9(c)	reduce / prevent growth / reproduction of microorganisms **or** to prevent decay **or** to preserve it **or** to keep it fresh **or** to prevent it becoming <u>too</u> sour	allow reference to germs ignore curdling	1
Total			**5**

4.3.1.1 Communicable (infectious) diseases

AQA

GCSE
BIOLOGY
8461/1F

Paper 1 Foundation Tier

Mark scheme

June 2020

Version: 1.0 Final Mark Scheme

jun2084611F/MS

4.3.1.1 Communicable (infectious) diseases

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this mark scheme are available from aqa.org.uk

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Information to Examiners

1. General

The mark scheme for each question shows:

- the marks available for each part of the question
- the total marks available for the question
- the typical answer or answers which are expected
- extra information to help the Examiner make his or her judgement
- the Assessment Objectives, level of demand and specification content that each question is intended to cover.

The extra information is aligned to the appropriate answer in the left-hand part of the mark scheme and should only be applied to that item in the mark scheme.

At the beginning of a part of a question a reminder may be given, for example: where consequential marking needs to be considered in a calculation; or the answer may be on the diagram or at a different place on the script.

In general the right-hand side of the mark scheme is there to provide those extra details which confuse the main part of the mark scheme yet may be helpful in ensuring that marking is straightforward and consistent.

2. Emboldening and underlining

2.1 In a list of acceptable answers where more than one mark is available 'any **two** from' is used, with the number of marks emboldened. Each of the following bullet points is a potential mark.

2.2 A bold **and** is used to indicate that both parts of the answer are required to award the mark.

2.3 Alternative answers acceptable for a mark are indicated by the use of **or**. Different terms in the mark scheme are shown by a / ; eg allow smooth / free movement.

2.4 Any wording that is underlined is essential for the marking point to be awarded.

3. Marking points

3.1 Marking of lists

This applies to questions requiring a set number of responses, but for which students have provided extra responses. The general principle to be followed in such a situation is that 'right + wrong = wrong'.

Each error/contradiction negates each correct response. So, if the number of error/contradictions equals or exceeds the number of marks available for the question, no marks can be awarded.

However, responses considered to be neutral (indicated as * in example 1) are not penalised.

Example 1: What is the pH of an acidic solution?

[1 mark]

Student	Response	Marks awarded
1	green, 5	0
2	red*, 5	1
3	red*, 8	0

Example 2: Name two planets in the solar system.

[2 marks]

Student	Response	Marks awarded
1	Neptune, Mars, Moon	1
2	Neptune, Sun, Mars, Moon	0

3.2 Use of chemical symbols/formulae

If a student writes a chemical symbol/formula instead of a required chemical name, full credit can be given if the symbol/formula is correct and if, in the context of the question, such action is appropriate.

3.3 Marking procedure for calculations

Marks should be awarded for each stage of the calculation completed correctly, as students are instructed to show their working. Full marks can, however, be given for a correct numerical answer, without any working shown.

3.4 Interpretation of 'it'

Answers using the word 'it' should be given credit only if it is clear that the 'it' refers to the correct subject.

3.5 Errors carried forward

Any error in the answers to a structured question should be penalised once only.

Papers should be constructed in such a way that the number of times errors can be carried forward is kept to a minimum. Allowances for errors carried forward are most likely to be restricted to calculation questions and should be shown by the abbreviation ecf in the marking scheme.

3.6 Phonetic spelling

The phonetic spelling of correct scientific terminology should be credited **unless** there is a possible confusion with another technical term.

3.7 Brackets

(…..) are used to indicate information which is not essential for the mark to be awarded but is included to help the examiner identify the sense of the answer required.

3.8 Allow

In the mark scheme additional information, 'allow' is used to indicate creditworthy alternative answers.

3.9 Ignore

Ignore is used when the information given is irrelevant to the question or not enough to gain the marking point. Any further correct amplification could gain the marking point.

3.10 Do <u>not</u> accept

Do **not** accept means that this is a wrong answer which, even if the correct answer is given as well, will still mean that the mark is not awarded.

4. Level of response marking instructions

Extended response questions are marked on level of response mark schemes.

- Level of response mark schemes are broken down into levels, each of which has a descriptor.
- The descriptor for the level shows the average performance for the level.
- There are two marks in each level.

Before you apply the mark scheme to a student's answer, read through the answer and annotate it (as instructed) to show the qualities that are being looked for. You can then apply the mark scheme.

Step 1: Determine a level

Start at the lowest level of the mark scheme and use it as a ladder to see whether the answer meets the descriptor for that level. The descriptor for the level indicates the different qualities that might be seen in the student's answer for that level. If it meets the lowest level then go to the next one and decide if it meets this level, and so on, until you have a match between the level descriptor and the answer.

When assigning a level you should look at the overall quality of the answer. Do **not** look to penalise small and specific parts of the answer where the student has not performed quite as well as the rest. If the answer covers different aspects of different levels of the mark scheme you should use a best fit approach for defining the level.

Use the variability of the response to help decide the mark within the level, ie if the response is predominantly level 2 with a small amount of level 3 material it would be placed in level 2 but be awarded a mark near the top of the level because of the level 3 content.

Step 2: Determine a mark

Once you have assigned a level you need to decide on the mark. The descriptors on how to allocate marks can help with this.

The exemplar materials used during standardisation will help. There will be an answer in the standardising materials which will correspond with each level of the mark scheme. This answer will have been awarded a mark by the Lead Examiner. You can compare the student's answer with the example to determine if it is the same standard, better or worse than the example. You can then use this to allocate a mark for the answer based on the Lead Examiner's mark on the example.

You may well need to read back through the answer as you apply the mark scheme to clarify points and assure yourself that the level and the mark are appropriate.

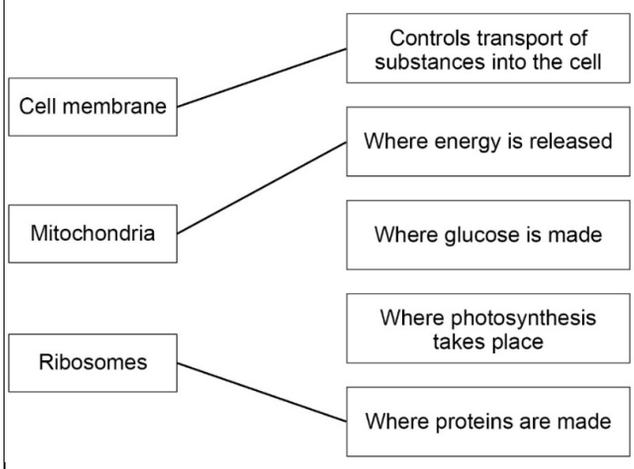
Indicative content in the mark scheme is provided as a guide for examiners. It is not intended to be exhaustive and you must credit other valid points. Students do **not** have to cover all of the points mentioned in the indicative content to reach the highest level of the mark scheme.

You should ignore any irrelevant points made. However, full marks can be awarded only if there are no incorrect statements that contradict a correct response.

An answer which contains nothing of relevance to the question must be awarded no marks.

4.3.1.1 Communicable (infectious) diseases

MARK SCHEME – GCSE BIOLOGY – 8461/1F – JUNE 2020

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.1	bacterium		1	AO2 4.1.1.1
01.2	to strengthen the cell		1	AO1 4.1.1.1 4.1.1.2
01.3	chloroplast		1	AO2 4.1.1.2 4.2.3.1
01.4	**Structure** **Function**  additional line from a box on the left negates the mark for that box		3	AO1 4.1.1.2 4.1.3.1
01.5	adjust the focus knob		1	AO3 4.1.1.2 RPA1
01.6	(A =) 15 (mm) (B =) 60 (mm)	allow a tolerance of ± 1mm	1 1	AO2 4.1.1.2 RPA 1
01.7	$\frac{60}{15} = 4(.0)$	allow ecf from question **01.6**	1	AO2 4.1.1.2 RPA 1

4.3.1.1 Communicable (infectious) diseases

01.8	$\frac{40}{0.1}$ 400	 do **not** accept if a unit is given	1 1	AO2 4.1.1.5 RPA 1
Total			**12**	

4.3.1.1 Communicable (infectious) diseases

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.1	mitosis		1	AO1 4.1.2.2
02.2	all lines correct = **2** marks 1 or 2 lines correct = **1** mark **Stage of cell cycle** / **What happens during that stage** Stage 1 → The cell grows and the chromosomes replicate Stage 2 → One set of chromosomes is pulled to each end of the cell Stage 3 → The cytoplasm and cell membrane divide to form two new cells additional line from a box on the left negates the credit for that box		2	AO1 4.1.2.2
02.3	$\frac{7}{10} \times 100$ 70(%)	allow $\frac{252}{300} \times 100$ allow answer calculated from angle in range 250° to 254° if no other mark awarded, allow 0.7 for **1** mark	1 1	AO2 4.1.2.2
02.4	3		1	AO2 4.1.2.2
02.5	DNA	allow deoxyribonucleic acid	1	AO1 4.1.2.1 4.1.2.2
02.6	a gene		1	AO1 4.1.2.1

4.3.1.1 Communicable (infectious) diseases

02.7	(bone marrow) cells differentiate into many / other types of (named) cell (so) will cure diseases where new cells are needed **or** will cure diseases where cells are damaged	allow (bone marrow) cells can become many / other types of (named) cell allow (so) will cure anaemia / leukaemia **or** blood cancer **or** blood disorders allow (so) will cure paralysis / diabetes	1 1	AO1 AO2 4.1.2.3
Total			**10**	

4.3.1.1 Communicable (infectious) diseases

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.1	any **one** from: • bacteria • fungi • protists	allow singular allow names of pathogens e.g. Salmonella ignore virus / germ	1	AO1 4.3.1.1 4.3.1.3 4.3.1.5
03.2	hydrochloric acid is produced by the stomach the skin is a barrier covering the whole body		1 1	AO1 4.2.2.1 4.3.1.6
03.3	white blood cells engulf the microorganisms.		1	AO1 4.2.2.3 4.3.1.6
03.4	weakened fast	in this order only	1 1	AO1 4.3.1.7
03.5	by coughs / sneezes	allow 'by droplets in the air' do **not** accept other means of transmission e.g. touch	1	AO1 4.3.1.1 4.3.1.2
03.6	(from day) 10 (to day) 18	allow (from day) 18 (to day) 10	1	AO2 4.3.1.2
03.7	14 (days)	allow in the range 13 to 15 (days)	1	AO3 4.3.1.2
03.8	any **one** from: • they had been vaccinated • they already had antibodies • they were immune • they had had it before • they did not get any / enough virus from infected child • they did not play (much) with the infected child	 ignore they were resistant ignore they wore a mask unqualified	1	AO3 4.3.1.2 4.3.1.7

4.3.1.1 Communicable (infectious) diseases

03.9	antibiotics do not kill viruses	allow antibiotics do not work on viruses allow antibiotics only kill bacteria	1	AO3 4.3.1.8
Total			**11**	

4.3.1.1 Communicable (infectious) diseases

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.1	increased (at first) until 4 minutes **or** 50 breaths per minute (then) stayed constant (from 4 minutes **or** at 50 breaths per minute)		1 1 1	AO2 4.4.2.2
04.2	175 (beats per minute)		1	AO2 4.4.2.2
04.3	140 (beats per minute)		1	AO2 4.4.2.2
04.4	because his rate is lower than the maximum safe rate	allow ecf for incorrect values in question **04.2** and question **04.3**	1	AO3 4.2.2.2 4.4.2.2

4.3.1.1 Communicable (infectious) diseases

04.5	**Level 3:** Relevant points (reasons/causes) are identified, given in detail and logically linked to form a clear account.	5–6	AO3
	Level 2: Relevant points (reasons/causes) are identified, and there are attempts at logical linking. The resulting account is not fully clear.	3–4	AO2
	Level 1: Points are identified and stated simply, but their relevance is not clear and there is no attempt at logical linking.	1–2	AO2
	No relevant content	0	

	Indicative content
	
	• heart rate increased
	  ○ to increase blood flowing to muscles / lungs
	  ○ to provide more oxygen (to muscles)
	  ○ to provide more glucose (to muscles)
	  ○ to remove carbon dioxide more quickly (from the muscles / blood)
	  ○ to remove lactic acid more quickly (from the muscles)
	
	• breathing rate increased
	  ○ supplies more oxygen / air to lungs
	  ○ so more oxygen to blood
	  ○ more carbon dioxide removed
	
	• more oxygen to muscles
	  ○ needed for (increased) respiration
	  ○ to release / provide energy
	  ○ for muscle contraction
	
	• anaerobic respiration occurs
	  ○ due to lack of oxygen
	  ○ which causes a build-up of lactic acid
	  ○ oxygen debt
	  ○ muscle fatigue / pain
	
	To reach **Level 3**, there must be reference to heart rate, breathing rate and respiration
			4.2.2.2
			4.2.2.3
			4.4.2.1
			4.4.2.3
			4.4.2.2

Total			**12**

4.3.1.1 Communicable (infectious) diseases

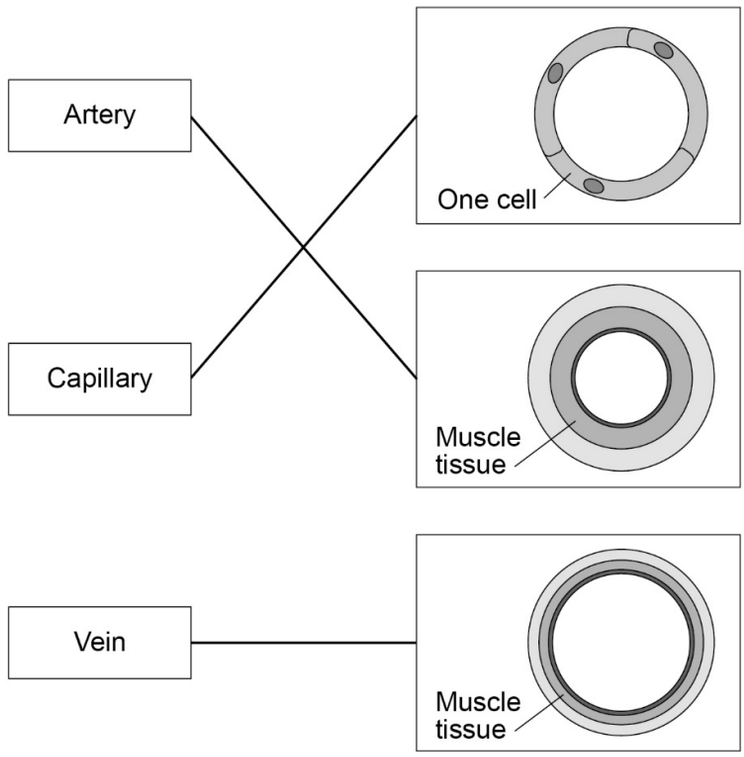
MARK SCHEME – GCSE BIOLOGY – 8461/1F – JUNE 2020

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.1	will stop animals / herbivores eating it	allow it will not be eaten	1	AO3 4.3.3.2
05.2	chemical		1	AO1 4.3.3.2
05.3	thorns / spikes / spines / prickles (to stop animals / herbivores eating it)		1	AO3 4.3.3.2
05.4	for respiration to store as starch		1 1	AO1 4.4.1.3 4.4.2.1
05.5	add Benedict's (solution / reagent to the liquid) boil / heat (if glucose is present the blue) colour changes to yellow / green / orange / brown / (brick)red	 allow any temperature of 65 °C or above	1 1 1	AO1 4.2.2.1 RPA 4
05.6	(nitrate ions are needed) to make proteins / amino acids which are needed for growth / enzymes / new cells	allow to make chlorophyll / DNA / ATP / nucleic acid allow correct process for named molecule in mp1	1 1	AO1 AO2 4.1.3.3 4.4.1.3 4.4.2.3
05.7	in / on the (soil) water	allow through air (spaces) in the soil	1	AO3 4.3.1.1 4.3.1.4
05.8	dosage toxicity		1 1	AO1 4.3.1.9

4.3.1.1 Communicable (infectious) diseases

05.9	placebos		1	AO1 4.3.1.9
Total			**14**	

4.3.1.1 Communicable (infectious) diseases

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.1	all lines correct = **2** marks 1 **or** 2 lines correct = **1** mark **Type of blood vessel** / **Structure of blood vessel**  additional line from a box on the left negates the credit for that box		2	AO2 4.2.2.2

4.3.1.1 Communicable (infectious) diseases

06.2	any **one** from: • thick(er) (muscle) walls / tissue (1) to push blood (all) around the body (1) **or** • thick(er) elastic walls / tissue (1) to maintain / withstand high (blood) pressure **or** to retain / regain shape (1) **or** • narrow lumen (1) to maintain high (blood) pressure (1)	 allow to withstand high (blood) pressure do **not** accept to pump blood (all) around the body	2	AO1 4.2.2.2
06.3	(A) – white (blood) cell(s) (B) – platelet(s)	allow any named white (blood) cell(s)	1 1	AO2 4.2.2.3
06.4	(no nucleus) more space for haemoglobin / oxygen (has haemoglobin) to bind / carry oxygen	allow to carry more oxygen ignore carries carbon dioxide	1 1	AO3 4.1.1.2 4.1.1.3 4.2.2.3
06.5	plasma		1	AO1 4.2.2.3
06.6	platelets		1	AO3 4.2.2.3

4.3.1.1 Communicable (infectious) diseases

06.7	any **one** from: • (continued) bleeding • (more) bruising	allow described allow blood does not clot (at cuts) allow ecf from answer to question **06.6**	1	AO3 4.2.2.3
Total			**11**	

4.3.1.1 Communicable (infectious) diseases

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.1	*before arrow* carbon dioxide **and** water *after arrow* glucose	allow correct chemical symbols ignore any attempt at balancing equation ignore light / chlorophyll either order ignore sugar / carbohydrate do **not** accept starch	 1 1	AO1 4.4.1.1
07.2	light (light) is captured / trapped / absorbed by chlorophyll / chloroplasts	ignore description of subsequent parts of the photosynthesis reaction allow sunlight ignore sun allow (light) is used by chlorophyll / chloroplasts	 1 1	AO1 4.1.1.2 4.4.1.1
07.3	$\frac{(18.5 + 19.3 + 19.5)}{3}$ **or** $\frac{57.3}{3}$ 19.1 (cm^3/hour)	 allow an answer correctly calculated using only two correct values	1 1	AO2 4.4.1.2 RPA 6
07.4	a ring around 14.2	allow clear indication of correct result	1	AO3 4.4.1.2 RPA 6

4.3.1.1 Communicable (infectious) diseases

07.5	any **one** from: • scale / value was misread • there was air / oxygen in the syringe / measuring cylinder / apparatus • the lamp / light was moved • temperature changed • had different mass / length of pondweed • pondweed had not acclimatised	ignore human error ignore references to counting bubbles or time allow measurement error allow light intensity changed ignore different bulb / lamp unqualified	1	AO3 4.4.1.2 RPA 6
07.6	did not use it in calculation (of mean)		1	AO3 4.4.1.2 RPA 6
07.7	any **one** from: • light (intensity) • carbon dioxide (concentration) • pondweed size / amount • pondweed species	do **not** accept temperature ignore time allow distance / power / colour of lamp / light allow same (piece of) pondweed	1	AO3 4.4.1.2 RPA 6
07.8	enzyme(s) lose the shape of the active site	allow enzyme(s) (start to) denature allow enzyme(s) destroyed / damaged do **not** accept enzyme(s) killed	1	AO2 4.2.2.1

4.3.1.1 Communicable (infectious) diseases

07.9	y-axis labelled '(rate of) photosynthesis in cm^3/hour'		1	AO2 4.4.1.2 RPA 6
	suitable scale on y-axis	must take up half or more of grid provided	1	
	all points plotted to within ± ½ small square	allow 3 or 4 correct plots for **1** mark ignore any attempt to plot a point at 20 °C	2	
	correct curved line of best fit	ignore line joined point to point with straight lines ignore extrapolation	1	
Total			**16**	

4.3.1.1 Communicable (infectious) diseases

Question	Answers	Extra information	Mark	AO / Spec. Ref.
08.1	movement / spreading out of molecules / particles	allow movement / spreading out of (named) substances / chemicals / gases / liquids ignore reference to membranes / cells	1	AO1 4.1.3.1
	from (an area of) high(er) concentration to (an area of) low(er) concentration	allow down / with the concentration gradient ignore along / across the concentration gradient do **not** accept movement from / to a concentration gradient	1	
08.2	increased carbon dioxide concentration in the air		1	AO2 4.1.3.1 4.2.3.2
	increased number of stomata that are open		1	

4.3.1.1 Communicable (infectious) diseases

08.3	**Level 3:** Relevant points (reasons/causes) are identified, given in detail and logically linked to form a clear account.	5–6	AO1 4.1.3.1 4.2.2.2 4.2.2.3
	Level 2: Relevant points (reasons/causes) are identified, and there are attempts at logical linking. The resulting account is not fully clear.	3–4	
	Level 1: Points are identified and stated simply, but their relevance is not clear and there is no attempt at logical linking.	1–2	
	No relevant content	0	

	Indicative content
	• (many) alveoli
	  • provide a large(r) surface area (**:** volume)
	
	• capillaries are thin
	  or alveoli / capillary walls are thin **or** one cell thick
	  or capillaries are close to the alveoli
	  • which provides short diffusion path (for oxygen / carbon dioxide)
	
	• breathing (mechanism) moves air in and out
	or lungs are ventilated
	  • to bring in (fresh) oxygen
	  • to remove carbon dioxide
	  • to maintain a concentration / diffusion gradient`
	
	• large capillary network (around alveoli)
	or good blood supply
	  • to remove oxygen(ated blood) quickly
	  • to bring carbon dioxide to the lungs quickly
	  • to maintain a concentration / diffusion gradient		

4.3.1.1 Communicable (infectious) diseases

08.4	Osmosis	allow diffusion	1	AO1 4.1.3.1 4.2.3.2 4.1.3.2
08.5	active transport (because) energy is needed (to move nitrate ions) from a low(er) concentration (in the soil) to a high(er) concentration (in the root / cell)	 allow (to move nitrate ions) against / up the concentration gradient allow (because) there is a lower concentration (of nitrate ions) in the soil **or** (because) there is a higher concentration (of nitrate ions) in the root / cell ignore reference to amount / number of nitrate ions ignore along / across the concentration gradient do **not** accept if reference to molecules / atoms moving	1 1 1	AO3 AO2 AO2 4.1.1.3 4.2.3.2 4.1.3.3
Total			**14**	

4.3.1.1 Communicable (infectious) diseases

Answer 27 · Examiner comments November 2020 | 8461/1F | Original Q3

Question 3 (low & standard demand)

Throughout this question, students commonly used the term ‘infection’ as a synonym for bacteria, resulting in many unclear answers. **03.9** differentiated well between lower- and higher-attaining students.

Answer 29 · Examiner comments June 2022 | 8461/1F | Original Q1

Question 1 (Low demand)

01.1 The majority of students correctly identified sexual intercourse as causing the spread of HIV.

01.2 Many students failed to recognise that there were 2 marks available for this question, and only described the overall trend shown in the table, rather than the increase followed by the decrease. Students are encouraged to check the number of marks available for each question and structure their answer accordingly. Nearly 60% of students were awarded the fallback mark on this question, describing an overall decrease.

01.3 Nearly all students who attempted this question answered correctly.

01.4 Just under half of all students gained full marks in this question. Students would benefit from crossing off the letters they have already used in questions such as these, to prevent the same letter being used twice, as was seen on rare occasions.

01.5 Over 70% of students could identify the next stage in testing a vaccine following testing on live animals.

01.6 Over 80% of students knew that drugs that destroy viruses also damage body tissues.

01.7 Less than a third of students gained full marks in this question, and nearly 40% were awarded zero marks.

4.3.1.1 Communicable (infectious) diseases

Answer 30 · Examiner comments

June 2023 | 8461/1F | Original Q2

Question 2 (Low demand)

02.1 Nearly all students were able to determine 'pathogens' as being the name given to microorganisms that cause disease.

02.2 Almost 90% of students correctly linked both defences to the part of the body that provided the defence. Students should be reminded that they must not draw more than one line from a box on the left in these questions, as this will not gain credit.

02.3 A pleasing 90% of students knew that a tumour can form when changes to cells cause uncontrolled cell division**.**

02.4 Students have a clear understanding of features of malignant tumours, and indeed only around 4% of students gained zero marks on this question. Almost two thirds of students gained both available marks.

02.5 Over 95% of students gained this mark. A number went on to use data in support of their statements but this was not necessary. Some simply said that Table 2 showed that 'the vaccine had worked', but as the question asked specifically about how the **percentage** of females with HPV had changed, no credit could be given.

02.6 Surprisingly, only around 42% of students could suggest a correct reason for the change in HPV cases from 2010-2016. Many of these students correctly referred to more females, and sometimes more males as well, being vaccinated. Those failing to gain credit however, often simply stated 'vaccination' as the reason but gave no idea as to why the percentage continued to fall over time.

02.7 Nearly 80% of students knew that white blood cells respond to an inactive virus, and gained the mark.

02.8 While the most common incorrect answer was 'antibiotics', it was pleasing to see over 93% of students correctly identifying antibodies as being produced in response to the inactive virus.

02.9 Most credited responses here were around concerns of side effects from the vaccine and this was expressed in many different ways. Around 60% were in fact successful in gaining the mark. Reference to 'anti-vax' parents was seen but unless qualified as to the reason behind refusal to vaccinate it failed to gain a mark. Many students correctly quoted religious or cultural objections although, 'religion' or 'beliefs' on their own were insufficient. The idea that the vaccine might simply not work was commonly credited but answers such as 'parents are scared of the vaccine' or 'it's too expensive' gained no marks.

4.3.1.1 Communicable (infectious) diseases

Answer 31 · Examiner comments June 2024 | 8461/1F | Original Q2

Question 2 (low demand)

02.1 This question specifically asked how the skin protects against pathogens and not how the human body in general is able to defend itself. References to white blood cells, antibodies, mucus and stomach acid were therefore, not creditworthy. Some students made incorrect suggestions such as 'the hairs on the skin catch pathogens' or 'the pores are small so that pathogens cannot pass through them'. Others used descriptions that lacked specificity such as 'it has many layers' or 'it is thick and strong'. Nearly 60% of students gave the correct idea of the skin being a barrier or stopping pathogens from entering.

02.2 Just over 40% of students were awarded full marks in this question, with nearly 60% gaining the first marking point for a correct fraction but an incorrect simplification. A number of students found the fraction that killed rather than the fraction surviving, and therefore gained no credit.

02.3 Nearly 73% of students gained full marks in this question, and most made good use of the scaffolding provided. A number of students missed out on the third marking point due to not accurately copying their answer from parts 1 and/or 2 correctly and to complete the correct subtraction.

02.4 Students' ability to express themselves clearly, frequently limited their access to the marks available in this question. As a result, just under 27% of students achieved both marks. Some students found explanations difficult and gave answers that lacked clarity, such as 'it just fitted the pattern'. A frequent confused use of mean, mode, median and average was also seen.

4.3.1.1 Communicable (infectious) diseases

Answer 32 · Examiner comments

June 2025 | 8461/1F | Original Q3

Question 3 (low demand)

03.1 85% of students scored both marks in this question. The most commonly seen error was confusion between antitoxins and antibiotics.

03.2 Over half of all students scored full marks in this question, with the next most common mark being 3, indicating that the majority of students found this question easy to access. Guidance was provided through the use of scaffolding for each of the steps involved and this allowed many students to access at least 3 marks. A mistake made in one step did not necessarily preclude credit being awarded elsewhere. Common errors included:

- incorrect measurements of the white blood cell, giving answers in cm or inches, or referring to the vertical line rather than to the horizontal line for width.
- incorrectly carrying out the conversion by dividing, rather than multiplying, by 1000
- incorrectly transferring numbers from one step to another by omitting or adding zeros
- using the original pre-conversion width, rather than the calculated one in micrometres, in the final substitution.

03.3 Just under half of all students were able to identify the capillary shown in the figure.

4.3.1.1 Communicable (infectious) diseases

Answer 32 · Examiner comments June 2025 | 8461/1F | Original Q3

03.4 Although some students had a clear appreciation of why arteries needed to have thick walls, many (40%) were unable to gain even one mark here. The reasons behind this reflected both a lack of understanding and ineffective expression. MP1 required reference to high pressure, i.e. the conditions that made thick walls essential, and not just to 'pressure' without qualification that the pressure was 'high'. References to volume, rate of flow, direction of flow or the concentration of blood were also not creditworthy. To achieve MP2, responses then had to go on further, with an explanation of what the thick walls allowed or prevented. Responses that did not gain credit here were either:

- too vague, such as 'to stop damage', 'to prevent bleeding' or 'to keep the blood inside'.
- incorrect, such as 'to pump blood around', 'stop backflow' or 'protect from pathogens'.

03.5 10% of students did not attempt this question and a further 60% did not score credit. Many misinterpreted what was being asked for and answered in terms of risk factors, such as 'smoking', outcomes such as 'reduced blood flow' or treatments such as 'stents'. In some cases, responses were too vague to be creditworthy, such as 'blockages occur'. Incorrect answers included 'muscles in the walls contract', 'they shrink' or 'fatty acids build up'.

03.6 Many students gave answers which matched MP1 but fewer gained MP2 and as such, 50% of students scored one mark, with a further 15% scoring two marks. Responses such as 'it will create a blockage', 'it can lead to a reduction (or increase) in blood pressure', 'it causes blood to clot', 'it leads to blood flowing backwards' or 'the vessels are more likely to burst' were either insufficient or incorrect and gained no credit.
A significant number of students gained the fall-back mark by referring to the idea of the narrowed arteries leading to a heart attack.

03.7 Nearly half of all students scored full marks in this question, with the most common being a link between 'high blood cholesterol' and 'antibiotics'. The majority of students correctly associated 'heart failure' with 'heart transplant'.

03.8 Nearly three quarters of students gained credit in this question. Responses which were unable to gain credit included 'it cannot be treated', 'it is caused by the build-up of plaque', 'it has symptoms which are not easy to see' and 'it happens inside the body'.

Answer 33 · Examiner comments

June 2025 | 8461/1F | Original Q6

Question 6 (standard demand)

06.1 Over 40% of students gained credit for the answer of 'virus' here but there were, equally, many incorrect responses of 'bacteria' (around 45%). Other incorrect suggestions included 'vector', 'antitoxin', 'airborne', 'infectious', and 'fungi' and 'protists'. A surprisingly large number of students (15%) did not give any answer at all.

06.2 Nearly 40% of students correctly stated how measles could be spread, but a higher number (nearly 60%) referred, more vaguely, to 'direct contact' or 'through the air', neither of which gained credit. A few incorrectly believed that measles is a sexually transmitted disease.

06.3 Although 'willow' appeared in answers with reasonable frequency (35%), many students (45%) did not achieve this quite straightforward mark. A wide range of suggestions was evident with 'foxglove' perhaps being the most common incorrect example. A high proportion (over 17%) of students, sadly, did not attempt the question.

06.4 Nearly 70% of students achieved the mark in this question owing to the wide range of symptoms listed in the mark scheme. Occasional incorrect suggestions (25%) were made such as 'vomiting' or 'black spots'. Vague, unqualified responses such as 'temperature', 'feeling unwell' and 'changed skin colour' could not be credited.

06.5 Although students found this question accessible, very few (2%) managed to gain both marks, with 20% gaining 1 mark. Many simply answered in terms of what happens in the body as a result of vaccination. Others focused on 'children' in particular being vaccinated, referring to the ease of pathogen transfer from one child to another due to frequent close contact or to limited appreciation of hygiene. A number of answers included incorrect suggestions such as 'when the vaccinated children become adults they will have gained progressively increased immunity', 'they will be able to pass on their own immunity to their children' or 'they will then be unable to genetically pass measles on to the next generation'. MP1 was gained by a significant number through correctly referring to 'herd immunity' but many could not be awarded the mark by saying that 'fewer people would catch the disease', rather than 'have' it at any one particular time. MP2 required the idea of reduced likelihood, chance or probability of measles being spread and not a simple rewrite of the question in terms of 'therefore spread would be reduced'.

06.6 Several steps were involved in this question. Students were required to select data for unvaccinated children with severe measles and then use this percentage to calculate how many children this represented out of the total of 240. Although 55% of responses gained all 3 marks, common errors were seen. These included:

- calculations which used data for all bars
- incorrect choices from Figure 9
- mistakes in reading from the graph, for example, 55 instead of 45.

4.3.1.1 Communicable (infectious) diseases

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In all these instances, no credit could be awarded. Answers which showed errors in converting 45% to the actual number of children, such as 45÷240 or 240÷45, could only achieve MP1.

06.7 It was pleasing to see that students were not daunted by this question and that many made good attempts at answering. To do so, they had to appreciate exactly what the data in Figure 9 showed; the percentages of vaccinated and unvaccinated children who all had measles, and the degree of severity of these cases. The data did not show information about the likelihood of the children catching measles in the first place. Based on this information, students were required to say why the data supported all children being given a vaccination and to back up their statement with numerical evidence from Figure 9. This evidence did not need to be processed in any way to gain credit. Answers which matched both marks (17%) had to be clearly comparative, had to consider the severity of infection and had to give appropriate and accurate figures in support. Responses such as 'fewer vaccinated children had severe measles shown by there being 7 compared to 108 who had not been vaccinated', or, even more succinctly, '45% of unvaccinated children had a severe infection but only 3% of those who were vaccinated did', both gained full credit. Answers awarded only 1 mark (22%) often did not give comparative data or any data at all, despite the question asking for it. When student responses matched neither marking point (54%), it was usually because they referred to the value of vaccination only as a means of reducing the chance of getting measles in the first place.