

Biology GCSE Revision

Topic 3

Infection & Response

Mark Scheme

Question 1

question	answers	extra information	mark
1(a)(i)	lower percentage (of women) who died	allow fewer (women) died	1
	numerical reference to a pair of figures to show this	allow any difference in a pair of figures	1
1(a)(ii)	doctors were not transferring	ignore reference to nurses	1
	pathogens / bacteria / viruses / microorganisms / microbes	allow fungi ignore disease / germs / infection	1
1(b)	any three from: <ul style="list-style-type: none"> • 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
1(c)	any two from: <ul style="list-style-type: none"> • better understanding / knowledge of <u>immunity</u> • 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

BL1HP

Question 6

question	answers	extra information	mark
6(a)(i)	any one from: • (produce) toxins / poisons • (cause) damage to cells	kill / destroy cells allow kills white blood cells	1
6(a)(ii)	produce antitoxins engulf / ingest / digest pathogens / viruses / bacteria / microorganisms	accept phagocytosis or description ignore eat / consume / absorb for engulf ignore references to memory cells	1 1
6(b)(i)	dead / inactive / weakened (measles) pathogen / virus	accept idea of antigen / protein ignore bacteria	1 1
6(b)(ii)	(after infection) rise begins sooner / less lag time steeper / faster rise (in number) longer lasting or doesn't drop so quickly	accept converse if clearly referring to before vaccination idea of staying high for longer ignore reference to higher starting point	 1 1 1
6(b)(iii)	antibodies are specific or needs different antibodies	accept antigens are different or white blood cells do not recognise virus	1
6(c)	reduces spread of infection / less likely to get an epidemic	accept idea of eradicating measles	1
Total			10

BL1HP

Question 2

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

Question	Answers	Extra information	Mark	AO / spec ref.
4(a)	mumps rubella / German measles	in either order both needed for the mark ignore measles unqualified	1	AO1 1.1.2l
4(b)(i)	80(.0)	allow 1 mark for $\frac{504}{630}$ or 0.8	2	AO2 1.1.2
4(b)(ii)	less chance of epidemic / pandemic or less chance of spread of disease / measles / mumps / rubella	allow idea of herd immunity (increased protection for those who are not vaccinated) ignore less chance of getting the disease or to eradicate the disease	1	AO2 1.1.2e,l
4(c)(i)	dead / inactive pathogens / viruses / bacteria	allow antigens / proteins from pathogens / viruses / bacteria ignore microorganisms	1	AO1 1.1.2l
4(c)(ii)	white blood cells produce <u>antibodies</u> antibodies produced rapidly (on re-infection) or response rapid (on re-infection) these antibodies kill pathogens / viruses / bacteria	allow ecf if antibodies incorrectly identified in first marking point do not accept idea that original antibodies remain in blood and kill pathogens	1 1 1	AO1 1.1.2c,d,e,l
4(d)(i)	antibiotics don't kill viruses (because measles) virus / pathogen lives inside cells	allow antibiotics only kill bacteria allow antibiotics do not work inside cells or killing virus / pathogen would kill / damage cell	1 1	AO1 / AO2 1.1.2h
4(d)(ii)	(bacteria / pathogens) develop resistance (to antibiotic)	ignore reference to immunity ignore viruses develop resistance	1	AO1 1.1.2i,j
Total			11	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
4(a)	microorganism / bacteria / virus / fungus that causes (infectious) disease		1	AO1 1.1.2a
4(b)	reduce / stop use of (current) antibiotics (reduce / stop use) for non-serious / mild / viral infections	allow ensure course is completed allow use of variety of antibiotics	1 1	AO1 1.1.2j/k/ 1.8.1f
4(c)(i)	40 °C		1	AO2 1.1.2o
4(c)(ii)	any one from: <ul style="list-style-type: none"> microorganisms grow / reproduce / work / act faster results / product acquired sooner 		1	AO1 1.1.2o
Total			5	

BL1HP

Question 5

question	answers	extra information	mark
5 (a)(i)	dead / inactive / weakened	allow antigen / protein ignore ref to other components ignore small amount	1
	pathogen / bacterium / virus / microorganism	ignore germs / disease	1
5 (a)(ii)	white blood cells produce / release antibodies	antigen / antibiotic instead of antibody = max 2 accept lymphocytes / leucocytes / memory cells produce antibodies do not accept phagocytes	1
	antibodies produced quickly		1
	(these) antibodies destroy the pathogen	allow kill do not accept antibodies engulf pathogens	1
5 (b)(i)	(live) bacteria still in body	ignore numbers	1
	would reproduce	ignore mutation / growth	1
5 (b)(ii)	antibiotics / treatment ineffective or resistant pathogens survive	accept resistant out compete non-resistant	1
	these reproduce		1
	population of resistant pathogens increases	allow (resistant pathogens reproduce) rapidly	1
Total			10

Question	Answers	Extra information	Mark	AO / Spec. Ref.
6(a)	0.67(%)	<p>allow 0.6 or 0.7</p> <p>allow 1 mark for evidence of $(2 \times 10^6) \div (3 \times 10^8)$</p> <p>or</p> <p>allow 1 mark for 0.0067 or 0.6</p>	2	AO2 1.1.2
6(b)(i)	<p>idea that food chains start with plants / producers</p> <p>idea that these make food (for other organisms in the chain)</p>	<p>allow food chains do not start with animals or larvae are consumers</p> <p>allow idea that plants / producers photosynthesise or plants / producers get energy from the sun</p> <p>allow mosquito larvae do not make food / photosynthesise or mosquito larvae do not get energy from the sun</p>	<p>1</p> <p>1</p>	AO1 1.5.1a

Question	Answers	Extra information	Mark	AO / Spec. Ref.
6(b)(ii)	<p>any four from:</p> <ul style="list-style-type: none"> reasoned argument for or against release <p><i>advantages:</i></p> <ul style="list-style-type: none"> fewer mosquitos biting or spreading malaria fewer people get / die from malaria lower medical costs (for those infected or for treatment) or less healthcare needed better economically for developing / tropical countries. <p><i>disadvantages:</i></p> <ul style="list-style-type: none"> fewer crops reproduce poorer crop yield possible starvation (of people) high cost of GM production / mosquito release less food for bats / birds or bats / birds die gene could 'escape' into other wildlife / species 	<p>must refer to at least one advantage and one disadvantage. max 3 marks for either only advantages or only disadvantages</p> <p>allow people won't get / die from malaria</p> <p>allow fewer crops pollinated</p> <p>allow disruption to food chain / ecosystem or reduction of biodiversity</p> <p>ignore into plants</p>	4	AO3 1.7.2f

Question	Answers	Extra information	Mark	AO / Spec. Ref.
6(a)(i)	bacteria (in vaccine) are dead / inactive / weakened	allow converse for bacteria that cause the disease, if clear allow bacteria in vaccine are attenuated allow idea that only antigen from bacteria is in vaccine	1	AO1 1.1.2i
6(a)(ii)	for vaccinated person: idea that white blood cells have previously encountered (TB) bacteria so are ready to produce antibodies rapidly / immediately	allow converse for non-vaccinated person allow ref to memory cells allow idea of specificity of antibodies / white blood cells	1 1	AO2/3 1.1.2i
6(b)(i)	(most / all) non-resistant bacteria killed (by antibiotic) resistant bacteria reproduce so offspring are resistant	allow converse allow resistance allele passed on	1 1 1	AO1/2 1.1.2j
6(b)(ii)	infection is mild / non-serious (not using antibiotic) reduces (rate of) development of resistant strains	allow not life-threatening allow might be viral (1) and antibiotics do not kill viruses (1)	1 1	AO1/2 1.1.2i
Total			8	

BL1HP

Question 1

question	answers	extra information	mark
1 (a)	don't kill pathogens / bacteria / viruses / microbes / microorganisms	allow don't contain antibiotics ignore antibodies / attack / fight allow <u>only</u> treat symptoms / pain ignore kill disease / germs	1
1 (b)	any two from: <ul style="list-style-type: none"> • age • gender • extent / severity of pain or how long had pain <u>before</u> 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
1 (c)(i)	75	ignore calculations / %	1
1 (c)(ii)	faster pain relief / decrease	allow pain relief sooner or it works quicker or more pain relief at start / in first hour / $1\frac{3}{4}$ hours	1
1 (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 1 continues on the next page . . .

Question 1 continued

question	answers	extra information	mark
1 (d)	<p>any three from:</p> <p>(Yes because)</p> <ul style="list-style-type: none"> • 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) <p>(No because)</p> <ul style="list-style-type: none"> • drug X gives more pain relief • (A + B / they) might interact with each other • could result in overdose • could be more / new side effects 	<p>ignore yes or no</p> <p>if neither points gained allow (more) dangerous</p>	3
Total			10

COMPONENT NUMBER: BL1HP**Question 6**

question	answers	extra information	mark
6(a)(i)	any one from: <ul style="list-style-type: none"> • cells • tissues • (live) animals / named 	allow mammals	1
6(a)(ii)	any three from: <p>(to test for)</p> <ul style="list-style-type: none"> • toxicity / check not poisonous / not harmful • interaction with other drugs • efficacy or to see if they work or check if they treat the disease • dosage or how much is needed 	allow side-effect allow converse allow converse	3

Question 6 continues on the next page . . .

Question 6 continued

question	answers	extra information	mark
6(b)	<p>argued evaluation</p> <p>any six from:</p> <ul style="list-style-type: none"> • statin can damage / muscles / kidneys / organs but cholesterol blockers don't • statins can cause death but cholesterol blockers don't • cholesterol blockers can interfere with action of other drugs but statins don't • statins are for a life time but cholesterol blockers are not • statins (might) reduce cholesterol to zero but cholesterol blockers only reduce it or statins reduce cholesterol more • statins better for people with inherited high cholesterol • cholesterol blockers better for people with dietary cholesterol problems • taking/using statins/cholesterol blockers is better than dying from heart attack or build up of fat in blood vessels or reduced blood flow 	<p>comparison can be written anywhere in evaluation allow use of 'only' for implied comparison for each point eg only statins damage muscles / kidneys / organs</p> <p>ignore liver</p> <p>if neither of the first 2 points are given accept for 1 mark statins are more dangerous than cholesterol blockers or statins have more side effects</p> <p>allow statins (might) stop membrane / hormone production but cholesterol blockers don't</p>	6
Total			10