AQA GCSE Science Combined Higher

Practice answers

Question	Answers	Extra information	Mark	AO / Specification reference
01.1	dead / weakened (tetanus) bacteria	accept 'antigens'	1	AO2 4.3.1.7
01.2	line should be steeper with higher number of antibodies produced and last longer		1 1	AO2 4.3.1.7
01.3	fewer people will get the disease because they are immune fewer people are carriers of the disease so fewer people will be exposed to the disease		1 1	AO1 4.3.1.7
01.4	any **three** from: • a vaccination triggers an immune response (to a specific pathogen) • each pathogen has a specific antigen • white blood cells produce antibodies specific to a particular antigen • this provides immunity only against that particular pathogen		3	AO2 4.3.1.7
02.1	a group of similar cells working together to perform a function		1	AO1 4.3.1.6 4.2.1
02.2	to produce mucus / secretions / sticky fluid		1	AO3 4.3.1.6

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02.3	cilia waft / move the mucus, which contains trapped pathogens / microorganisms / dust particles, away from the lungs / towards the throat		1 1 1	AO2 4.3.1.6
02.4	any **three** from: • platelets in blood • cause a mesh of fibres / protein strands to form over the wound • red blood cells get trapped (in mesh) • clot dries to form a scab	award 1 mark for fibrinogen is converted into fibrin	3	AO1 4.3.1.6
02.5	produces antimicrobial secretions – destroy pathogenic bacteria **or** skin covered with microorganisms – acts as an extra barrier to pathogen entry	award 1 mark for feature and 1 mark for linked explanation	2	AO1 4.3.1.6
03.1	testing small dose on healthy volunteers – to check for side effects testing on cells – to find if the drug is toxic testing on large numbers of patients – to determine the optimum dose testing on small number of patients – to prove the drug is effective	all correct – 3 marks 2 or 3 correct – 2 marks 1 correct – 1 mark	3	AO1 4.3.1.9

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03.2	risk of bias		1	AO3 4.3.1.9
03.3	two sets of volunteers one group given placebo, other given drug neither patient nor doctor knows which patients are given which treatment		1 1 1	AO1 4.3.1.9
03.4	any **one** from: • all patients have access to a course of treatment / so the patient is not denied an existing treatment • unethical to deny a patient an existing treatment which would benefit them • to be able to compare the effectiveness of the new treatment over the existing treatment		1	AO3 4.3.1.9
04.1	any **three** from: • Alexander Fleming • was growing bacterial plates for research • some plates had mould also growing on them • which created a clear ring / bacteria-free region around the mould • he realised the mould killed the bacteria		3	AO1 4.3.1.8

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04.2	measles is a viral infection antibiotics only kill bacteria / cannot destroy a virus / viral infection		1 1	AO1 4.3.1.8
04.3	antibiotics kill specific strains / species of bacteria more than one type of antibiotic is needed to be able to treat all bacterial infections		1 1	AO1 4.3.1.8
04.4	any **six** from: • uncoated tablet reaches higher peak level in bloodstream • peak level reached more rapidly • positive effect / treatment on patient occurs more effectively / more quickly • level of erythromycin reduces rapidly over time • positive effect of drug becomes less / lower than coated tablet after 4 hours • coated tablet takes longer to reach peak level • maximum level of erythromycin in bloodstream lower than uncoated tablet peak • maximum level once reached is maintained • effect on bacterial infection constant • suggestion that coated tablet acts more slowly but more consistently so is more effective overall	award a maximum of 3 marks if only one tablet type is referred to in answer full marks require comparative statements between both types of tablet	6	AO3 4.3.1.8

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05.1	effectiveness of the drug / how well the drug works		1	AO1 4.3.1.9
05.2	any **two** from: • tissue culture / cells • computer modelling • animal testing		2	AO1 4.3.1.9
05.3	small number of patients / volunteers who have the disease being targeted		1 1	AO1 4.3.1.9
05.4	four	award 1 mark for 4.03 or 13 × 0.31	2	AO2 4.3.1.9 MS 1c, 1d
05.5	success rate = 5.1% / 0.051 number of drugs trialled = $\frac{59}{0.051}$ 1156 or 1157		1 1 1	AO2 4.3.1.9 MS 1c, 1d
06.1	it is a virus		1	AO1 4.3.1.8
06.2	willow tree		1	AO1 4.3.1.8
06.3	aspirin will treat symptoms of measles so the child will feel better while the aspirin is acting		1 1	AO1 4.3.1.8

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06.4	any **four** from: • dead / inactive / weakend pathogen introduced to the body • recognised as being foreign by white blood cell / triggers an immune response • white blood cells respond produce antibodies • antibodies are specific to pathogen • antibodies produced quickly (on reinfection) / rapid response • antibodies produced in larger quantities • killing the pathogen		4	AO1 4.3.1.8
06.5	the level of infection will increase in the population as more children will be infected / carry / transfer the disease		1 1	AO1 4.3.1.8
07.1	6000	accept answer in range 5500–7000	1	AO2 4.3.1.7 MS 4a

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07.2	any **two** from: • poorer healthcare available • less effective diagnosis • poorer sanitary conditions • less education on effective hygiene practices		2	AO3 4.3.1.7
07.3	% change = $\frac{60\,000 - 20\,000}{60\,000} \times 100$ = –66.7%		1 1	AO2 4.3.1.7 MS 1c, 4a
07.4	answer in range 1939–1944 any **two** from: • after this time number of cases decreased • because children could not catch diphtheria • and fewer children were carriers of the disease / were able to infect others	ignore comments relating to 1942–1944 increase in number of cases	1 2	AO3 4.3.1.7

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Question	Answers	Extra information	Mark	AO / Specification reference
07.5	any **three** from: • diphtheria is not vaccinated against in all countries / is more common in some other countries • not all people are vaccinated in the uk • vaccination may become less effective over time • an unvaccinated person could catch the condition while travelling abroad / coming into contact with an infected person from abroad / contacting materials used by an infected person		3	AO3 4.3.1.7
08.1	presence of hydrochloric acid in the stomach		1	AO1 4.3.1.6
08.2	white blood cells destroy pathogens / bacteria / viruses if number of white blood cells falls, fewer pathogens will be destroyed, increasing likelihood of infection (mechanisms of white blood cell defence) – any **four** from: • engulf / ingest microorganism • production of antibodies to target / destroy particular pathogens • antibodies can remain in body causing immunity • each pathogen needs a specific antibody • production of antitoxins • counteract toxins released by pathogens	accept converse	1 1 4	AO1 4.3.1.6

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09	up to any **two** from: • identification of potential new compounds that kill bacteria • from newly discovered plant species / through synthesis by research chemists / through computer modelling up to any **two** from: • laboratory testing on cells / tissue cultures / live animals up to any **two** from: • clinical trials • testing on small group of healthy volunteers • with very low doses of the drug • testing on small group of patients with bacterial infection • testing on large group of patients with bacterial infection • using, e.g. double blind test • results peer-reviewed before drug is approved	award six marks only if all sections of the question are attempted	6	AO1×3 AO2×3 4.3.1.9
10.1	no – it is not caused by a pathogen so cannot be transmitted between organisms	accept not an infection disease	1 1	AO1 4.3.1.1
10.2	neither the doctors nor the patients know who is having the treatment drug or the placebo		1 1	AO1 4.3.1.9

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10.3	any **four** from: • control group had increase (of 10 mg) in mass of fatty material • treatment group had decrease (of 50 mg) in mass of fatty material • difference in mean change of mass of 60 mg • lowest possible change in mass of placebo group –10 mg • maximum possible change of treatment group 0 mg		4	AO2 4.3.1.9
10.4	any **four** from: • drug causes a decrease in mean mass of fatty deposits • appears to be an effective treatment • significant uncertainty in results • so treatment must not work for some people / may have opposite effect in some people • taking uncertainty into account, no conclusion can be formed • so impossible to say if an effective treatment or not		4	AO3 4.3.1.9