AQA GCSE Science Combined Higher

Practice answers

OXFORD Revise

Question	Answers	Extra information	Mark	AO / Specification reference
01.1	50		1	AO2 4.7.2.1 Ms4a
01.2	number of moose in 1982 = 800 number of moose in 1996 = 2400 difference = 2400 – 800 = 1600 percentage increase = (1600/800) × 100 percentage increase = 200%		1 1 1 1	AO2 4.7.2.1 Ms 1c, 4a
01.3	when many moose available, food is available to support larger population of wolves more wolves survive (and reproduce) increasing the wolf population as the wolf population increases, more moose are killed so the moose population falls less food is available for wolves so fewer survive (and reproduce) so the wolf population falls		4	AO2 4.7.2.1
01.4	any **two** from: • (new) disease could reduce population • extreme weather could kill wolves / cause offspring to perish, reducing population • human hunters could kill wolves, reducing population population of other prey species could increase, enabling a larger population of wolves to survive	accept other reasonable suggestion with linked explanation accept converse arguments	2	AO3 4.7.2.1
02.1	14		1	AO2 4.7.2.1 Ms 2f

02.2	12		1	AO2 4.7.2.1 Ms2b, 2f
02.3	median because this average ignores the outlier which may not be indicative of 1/8th of the school field area **or** mean because the outlier is a true value and may be indicative of areas of the school field and so should be included in the students' calculation	marks are awarded for the explanation, not for selection of mean or median do not award marks if the explanation does not link to the selected average type	2	AO3 4.7.2.1
02.4	area = 350 × 200 either: if median selected in 02.3: number = 70 000 × 14 = 980 000 **or** if mean selected: number = 70 000 × 12 = 840 000		1 1 1	AO2 4.7.2.1 MS 5c, 2d
02.5	any **two** suggestion and explanation from: • trampled area ○ which has prevented daisies establishing • shaded area ○ preventing daisies growing • random variation no daisies established there / competition from other species	to award full marks, answers should include two valid suggestions with linked explanations accept other valid suggestions with linked explanations	4	AO3 4.7.2.1
03.1	deforestation		1	AO1 4.7.3.4
03.2	less photosynthesis combustion / burning (to clear land) increased level of decay (of felled trees)		1 1 1	AO2 4.7.3.4

03.3	any **three** from: • rainforest – high biodiversity / agricultural land – low biodiversity • removal of trees removes shelter / habitat for animal species, so fewer species can survive there • removing trees removes a varied food source for animals, so fewer species are able to survive there • removing many types of plant / tree species reduces biodiversity / growing one/few species for agriculture limits biodiversity smaller populations of animal species are more vulnerable to dying out in an area, reducing biodiversity		3	AO2 4.7.3.4
03.4	deforestation leads to increased CO_2 levels in the Earth's atmosphere so more (infra red) radiation emitted from the Earth's surface is retained by the atmosphere leading to an increase in the mean temperature in the atmosphere / global warming causing changes to the Earth's / a country's climate		1 1 1 1	AO2 4.7.3.4 4.7.3.5
04.1	variety of all the different species of organism within an ecosystem / area / on the earth		1	AO1 4.7.3.1
04.2	breeding programmes reintroduction of hedgerows		1 1	AO2 4.7.3.1
04.3	if the one species of trees is destroyed/ killed by a pathogen there is no other food source / shelter to support other organisms in the ecosystem/woodland so their numbers will decrease	accept converse	1 1 1	AO2 4.7.3.1

05.1	any **two** from: • temperature • water availability / rainfall • minerals / ions in soil pH (of soil)		2	AO2 4.7.2.1
05.2	population estimate = sample x area = 12 x 9000 = 108 000 sample may not be representative of whole field a single buttercup more / less than 'average' will have a significant effect on calculated population so student's statement is likely to be inaccurate / not a statement of the true value	sample number of buttercups = 12 / m^2 field area = 150 x 60 = 9000 m^2 population = 12 x 9000	3 1 1 1	AO2 AO3 4.7.2.1
05.3	do (many) repeats as this will help to smooth out random variations in the number of buttercups in a particular location place the quadrats randomly / use a grid with a random number generator to select locations for quadrats so the samples become a true reflection of the buttercup distribution across the field	accept other sensible suggestions - 1 mark for improvement, 1 mark for reasoning	1 1 1 1	AO2 4.7.2.1

06.1	any **six** from: • algae/plants remove CO_2 from the atmosphere by photosynthesis • these plants will use the CO_2 to make glucose • plant respiration releases CO_2 into the atmosphere • animals will eat the plants which contain carbon passing it between organisms • animals also respire releasing CO_2 into the atmosphere • animals and plants will eventually die and decay due to microbial/bacterial action releasing CO_2 • combustion/burning of fossil fuels will release CO_2 into the atmosphere the burning of carbon based products made from trees will release CO_2 into the atmosphere		6	AO1 4.7.2.2
06.2	1.66×10^{14} kg	accept 1.66×10^{11} tonnes for 1 mark	2	AO2 4.7.2.2
06.3	removal of trees decreases the amount of carbon dioxide through the atmosphere by photosynthesis trees left to decompose and microorganisms release carbon dioxide into the atmosphere/Trees are burnt and combustion releases carbon dioxide into atmosphere net result is increased atmospheric carbon dioxide levels		3	AO2 4.7.2.2
06.4	global warming/climate change		1	AO1 4.7.3.5
06.5	increased CO_2 level may lead to increase in atmospheric temperature photosynthesis occurs more rapidly at higher temperatures CO_2 concentration is limiting factor increasing CO_2 concentration will increase rate of photosynthesis		1 1 1 1	AO3 4.4.1.2 4.7.2.2

07.1	oak tree		1	AO2 4.7.2.1
07.2	hawk		1	AO2 4.7.2.1
07.3	light / sun		1	AO1 4.7.2.1
07.4	caterpillar / sparrow		1	AO2 4.7.2.1

07.5	any **one** suggestion and explanation from:
	• camouflage
	  ○ so organism is harder to be seen
	• good hearing
	  ○ so can detect predator coming and move away
	• named defence mechanism, e.g. warning colouration to mimic poisonous plants
		allow one mark for a sensible adaptation and one mark for linked explanation	2	AO2
				4.7.2.1
				4.7.1.4

07.6	fewer hawk / no hawk to eat the sparrows so sparrow population would increase so number of caterpillars would go down / more caterpillars would be eaten		1 1 1	AO3 4.7.2.1

08.1	any **six** from: • precipitation–water falls to land as rain, snow, hail, or sleet • run off–water runs into stream / river / lake / ocean from the ground • percolation–water trickles through gaps in soil / rock • respiration–water released from animals and plants during life / death during decay • transpiration–water released into atmosphere by plants; evaporation – water turned from liquid to water vapour as Sun heats Earth's surface condensation–water vapour condensed back to liquid (to form clouds) as moist air rises	term and correct description needed for each mark	6	AO1 4.7.2.2
08.2	any **two** suggestion and explanation from: • respiration ○ water produced as a waste product when glucose and oxygen react to release energy • sweat ○ water evaporates out of sweat to cool an organism when it is too hot • urine excess water is filtered out of the blood by the kidneys into the urine	award one mark for each correct source and one mark for each linked explanation accept any sensible answers	4	A01 4.7.2.2

08.3	any **four** from: • water major constituent of all living cells • chemical reactions of life (photosynthesis and respiration) take place in solution / in water • water needed by plants for support / rigidity • water transports dissolved minerals / nutrients to an area water helps dissipate some waste materials from an area		4	A01 4.7.2.2
08.4	carbon / nitrogen	accept any other appropriate material	1	A01 4.7.2.2
09.1	lay out a measuring tape (perpendicular) from the footpath place a quadrat a distance of 1m from the footpath count the number of animals at this point note the percentage ground cover of plants at this point move quadrat 1m further away from footpath, and repeat measurements repeat at 1m intervals until 10m from footpath		1 1 1 1 1 1	AO2 4.7.2.1
09.2	spiders		1	AO2 Ms 4a 4.7.2.1
09.3	any **two** from: • trampled ground has a greater proportion of bare ground • mosses are found in every area • oak trees are found at least 5m from the path ants are found furthest away from the path	accept any two relevant conclusions from the data	2	AO3 4.7.2.1
09.4	gather evidence / data from other areas with same conditions, e.g. trampled ground and compare the conclusions drawn / data gathered with the original area	accept for two marks complete belt transect and compare results from multiple areas with original findings	1 1	AO3 4.7.2.1

10.1	any **six** from: • burning / combustion • converting carbon in fuel into carbon dioxide • photosynthesis • converting atmospheric carbon dioxide into carbon compounds in plants • respiration • converting carbon from food sources into (atmospheric) carbon dioxide • feeding carbon passed from organism to organism	allow six marks for an appropriately labelled diagram accept decay / decomposition	6	AO1 4.7.2.2
10.2	increased rate of combustion (of fossil fuels) increases atmospheric CO_2 concentration deforestation reduces rate of CO_2 removal from atmosphere		4	AO1 4.7.2.2

11.1	any **three** suggestion and explanation from:
	• Generate electricity using renewable energy resources such as the use of solar panels / wind turbines
	  ○ to reduce the rate of combustion of fossil fuels
	• Use public transport / walk / cycle to reduce car usage
	  ○ to reduce rate of burning fossil fuels in car
	• Buy sustainably farmed food and fuels
	  ○ to reduce deforestation
	• Eat less meat / eat a vegetarian diet
	  ○ to reduce (intensive) animal farming / use of pesticides (or other named chemical)
	• Reduce volume of disposable materials used (e.g. single-use plastics) by purchasing reusable containers
	  ○ which reduces the energy consumption to manufacture them
	• Recycle materials
	  ○ because the energy to produced recycled materials is lower than the energy required to manufacture from raw materials
	• Introduce higher taxes for industries which generate greenhouse gas emissions / tax incentives for low-emission technologies
	to promote industry switching away from practices which generate large volumes of greenhouse gas emissions
		award 1 mark for each suggestion and one mark for each linked explanation
		
		accept other sensible answers
			6	AO3
				4.7.3.5

11.2	any **two** suggestion and explanations from:
	• loss of habitat
	  ○ from flooding through sea level rises
	  ○ reducing biodiversity
	• changes in organism distributions
	  ○ through temperature changes / rainfall pattern changes
	  ○ organisms may disappear from some areas as habitat changes / other animals are able to inhabit a greater area
	• changes in migration patterns
	  ○ caused by changes in climates and seasons
	distribution of birds / mammals / insects may change
		to award 6 marks, answers should include two biological effects of global warming (1 mark), with a linked explanation of the effect (2 marks)	6	AO2
				4.7.3.5

11.3	line of best fit 2014: 0.8 2025: 1.2	 accept value between 0.77 and 0.83 accept value between 1.17 and 1.23	1 1 1	AO2 AO3 4.7.3.5
11.4	2014 because there is data for preceding and following years whereas greater extrapolation is required for 2025, rate of change may be different		2	AO3
12.1	any **two** from: glass / tin / aluminium / paper / cardboard / (some plastics)		2	A01 4.7.3.6

12.2	any **two** suggestion and explanations from:
	• less material is placed in landfill
	  ○ so less contamination of land
	• less raw materials need to be mined / used
	  ○ to produce new materials / objects
	• less energy is used to recycle materials (compared to manufacturing from raw materials)
	so less energy required / less CO_2 emissions
		to award 4 marks answers should include two benefits and two linked explanations
		
		accept other reasonable benefit and explanation for 2 marks
			4	A01
				4.7.3.6

12.3	any **four** from: • recycling rate increasing at approx. 1% per year • six years between last date of data and target date • if previous improvements are maintained target will be met • however, rate of increase not linear • more recent increases have been <1% per year so possibility target will not be met		4	AO3 4.7.3.6