AQA GCSE Science Combined Higher

Practice answers

Question	Answers	Extra information	Mark	AO / Specification reference
01.1	organisms that can breed to produce fertile offspring		1	AO1 4.6.2.2
01.2	chimpanzees		1	AO2 4.6.4
01.3	variation survive characteristics phenotype		1 1 1 1	AO1 4.6.2.2
02.1	when antibiotics are used some bacteria survive these have (through mutation) antibiotic resistance these bacteria reproduce, increasing the population of resistant bacteria over time, the whole population become descended from the bacteria-resistant bacteria		1 1 1 1	AO2 4.6.3.4 4.6.3.7
02.2	725%	accept $\frac{(1625-200)}{200}$ for 1 mark	2	AO2 Ms 1c, 4a
02.3	as more people are infected with MRSA, the chance of infection of a healthy person increases This means more people catch the infection and as there is no cure the number of deaths increases		1 1	AO3 4.6.3.7

02.4	any **two** from: • improved hygiene (in hospitals) / washing hands • better control measures / quarantine for infected people • ensuring those in contact with contagious people / materials wore protective clothing / gloves / mask • ensuring wounds were covered new antibiotic developed / more effective treatment made available	accept other reasonable suggestions	2	AO3 4.6.3.7
02.5	bacterial reproduction takes place very rapidly / mutations in DNA are rapidly passed on if a mutation gives antibiotic resistance in a short period of time many bacteria will share this (advantageous) characteristic		2	AO2 4.6.3.7
03.1	no remaining individuals of a species are alive		1	AO1 4.6.3.6
03.2	any **four** from: • rats and dogs would be predators to dodos • humans hunted dodos • dodos unable to fly therefore unable to avoid predators • dodo numbers would decline as a result of predation • rats / dogs may also have eaten dodo eggs • so fewer offspring born over time leading to no individual dodos remaining		4	AO3 4.6.3.6
03.3	the entire genetic material of an organism		1	AO1 4.6.1.4

03.4	any **two** from: • to classify the dodo more accurately • to look for evolutionary links to other (living) organisms to support efforts to recreate the dodo from its genetic code	accept other reasonable suggestion	2	AO3 4.6.1.4 4.6.3.6 4.6.3.4 4.6.4
04.1	any **three** from: • parts of organisms such as bones that have not decayed / preserved in amber / resin • conditions needed for decay are absent • accept appropriate examples, e.g. acidic bogs / lack of oxygen • parts of the organism are replaced by other materials as they decay / mineralised preserved traces of organisms / footprints / burrows and rootlet traces		3	AO1 4.6.3.5
04.2	not all fossils have been found yet not all parts of organisms become fossils some fossils have been destroyed in the rock cycle		1 1 1	AO1 4.6.3.5
04.3	any **one** from: • darwin challenged the idea that all organisms were created by god • no absolute evidence for evolution no understanding of genes / mechanism of inheritance		1	AO1 4.6.3.1
04.4	antibiotic resistance in bacteria / other named example of evolution by natural selection / extinction		1	AO1 4.6.3.1 4.6.3.4

05.1	any **six** from: • natural resistance occurs as result of variation in the population • variation is caused by mutations • when treated with Drug 2030 those with resistance survive (others die) and reproduce more • these bacteria pass on genetic material which codes for resistance • process is repeated many times • proportion of species in population with resistance increases / all bacteria now have resistance / new strain created which have resistance resistant strain spreads rapidly because people are not immune to it / there is no effective treatment		6	AO2 4.6.3.7
05.2	kills bacteria does not harm body cells		2	AO1 4.6.3.7

05.3	any **two** suggestion + explanation from:
	• do not use to treat viral infections
	  ○ will not work
	• do not use for mild conditions
	  ○ healthy bodies can fight off the infection without drugs
	• ensure patients finish the course of treatment
	  ○ ensures all bacteria are killed and none survive
	• restrict agricultural use (as a preventative method)
	to prevent the spread of antibiotic resistance from animal to human pathogens
		allow one mark for the strategy and one mark for the linked explanation	4	AO2
				4.6.3.7

06.1	physical structure (visible) characteristics		1 1	AO1 4.6.4

06.2	the blue tit belongs to the kingdom Animalia the blue tit belongs to the genus *Cyanistes*		1 1	AO2 4.6.4
06.3	more advanced microscopes / development of electron microscope which allow comparison of internal structures /more detailed comparison of structures chemical analysis of biological material/genome sequencing which allows DNA comparison / biochemical comparison to identify similarities (in evolution)	accept other explained advances in technology	1 1 1 1	AO1 4.6.4
07.1	soft parts will decay harder parts replaced by minerals over a long period of time		1 1 1	AO1 4.6.3.5
07.2	any **two** from: • change in environment e.g. climate ○ disrupting food chain / altering habitat • new predator ○ reducing population so death rate > birth rate • new disease ○ killing ammonites • catastrophic event e.g. volcanic eruption / meteorite impact ○ causing significant short-term environmental change / inhospitable conditions • evolution of more successful competitor removing e.g. food source	to award 4 marks answers should contain two suggestions and two linked reasons for extinction	4	AO3 4.6.3.5 4.6.3.6
07.3	adaptations suited to their environment little change to environment across this period of time		1 1	AO2 4.6.3.5
08.1	Archaea		1	AO1 4.6.4
08.2	Eukaryota		1	AO1 4.6.4

08.3	any **four** from: • classification was previously based on characteristics / the way different species looked • DNA analysis maps the genomes of organisms • this is the sequence of DNA base pairs that make up an organism • Woese used comparisons between genomes of organisms in different species (to see genetic similarities) DNA analysis is considered a more accurate way of classifying organisms		4	AO1 4.6.4
08.4	any **three** from: • all listed organisms come from a common ancestor • all listed organisms have some common genes • crocodiles and birds / tuataras and lizards and snakes are the most closely related organisms in the diagram / most genetically similar organisms to each other • mammals are the least related / least genetically similar organisms to tuatataras / lizards and snakes crocodiles and birds / tuataras and lizards and snakes evolved from a common ancestor	accept alternative correct conclusions	3	AO2 4.6.4
09.1	no organisms of the species are alive anywhere in the world		1	AO1 4.6.4
09.2	Agilisaurus		1	AO2 4.6.4
09.3	all heavier than the organisms they evolved from / increases		1	AO2 4.6.4
09.4	50 million years		1	AO2 4.6.4

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10.1	91.4%	accept for 1 mark 12.8 million species not identified accept (12.8 / 14) x 100 for 2 marks	3	AO2 4.6.3.6 MS 1c
10.2	any **two** from: • species may be found in unexplored / remote / inhospitable areas • species numbers may be very small species may be very similar to other species already identified	accept other reasonable suggestions	2	AO3 4.6.3.6
10.3	any **three** from: • change in climate • introduction / evolution of competitors • evolution of pathogens / disease catastrophic event e.g. meteor strike		3	AO1 4.6.3.6
10.4	mean extinction rate = 5 billion / 4 billion years = 1.25 species per year relative rate = 1250 / 1.25 = 1000 × greater		1 1 1 1	AO2 4.6.3.6 MS 1c
10.5	any **three** from: • hunting • deforestation • change of land use / habitat loss • climate change road building / urban spread		3	AO3 4.6.3.6
11.1	large holes allow small fish to escape which allows them to grow large enough to reproduce replacing larger fish caught for human consumption / so fish population remains constant		1 1 1	AO3 4.6.2.2

11.2	any **six** from: • lower numbers of large fish are available to breed • variation exists in the size at which fish can reproduce • variation is caused by (genetic) mutations • fish who breed at a smaller size / younger age are better adapted • therefore more survive and reproduce / have more offspring • alleles to reproduce earlier in life / when at a smaller size are passed on over many generations more fish are present in the population that can breed at a younger age / smaller size		6	AO2 4.6.2.2
11.3	strategy at least partially successful as cod stocks are rising / returning to former levels however stock levels are not yet at the level seen in 1970 success of strategy unknown for other species		3	AO3 4.6.2.2
11.4	300 – 350 thousand tonnes current rising trend expected to continue rate of population increase increasing / positive feedback cycle as more fish surviving means greater rate of reproduction	accept answer of 250–300 or 350–400 thousand tonnes for 1 mark	2 1 1	AO2 4.6.2.2