AQA GCSE Biology

Practice answers

OXFORD Revise

Question	Answers	Extra information	Mark	AO / Specification reference
01.1	distance the ruler fell (in mm)		1	AO2 4.5.2.1
01.2	any **one** from: • drop the ruler from the same height each time • let the ruler drop without using any force • use same ruler each time • thumb should be same distance from the ruler at the start • carry out the experiment with the lower arm resting in the same way on the table		1	AO2 4.5.2.1
01.3	0.39		1	AO2 4.5.2.1
01.4	0.25	also accept for 0.264	1	AO2 4.5.2.1 MS 2b, 2e
01.5	the conclusion is incorrect as there is no difference between the left-handed and right-handed results the conclusion can only be made for the students being tested / because the sample size was small, a general conclusion cannot be formed	if 0.264 given in q1.4, award 2 marks for: the conclusion is correct as the results for the right hand are faster than for the left hand	1 1 1	AO3 4.5.2.1

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Question	Answers	Extra information	Mark	AO / Specification reference
01.6	voluntary reaction time		1	AO2 4.5.2.1
01.7	reflex actions are automatic / this was a conscious action / required thought		1	AO2 4.5.2.1
01.8	any **three** from: • it takes time for an impulse to travel along neurones • the nervous system has synapses • it takes time for chemicals to diffuse across synapses • which further adds to the reaction time		3	AO2 4.5.2.1
02.1	maintenance of a constant internal environment		1	AO1 4.5.1
02.2	pH temperature	award a maximum of 1 mark for enzyme concentration / substrate concentration	2	AO1 4.5.1 4.2.2.1
02.3	occur without thought / conscious activity		1	AO1 4.5.1

Question	Answers	Extra information	Mark	AO / Specification reference
02.4	any **six** from; • consist of receptors, co-ordination centres and effectors • receptors detect stimuli • example for receptor stated such as light / sound / temperature / pressure / other named receptor • co-ordination centre processes information • co-ordination centre named – brain / spinal cord / pancreas / other named control centre • effectors bring about a change • named effector – muscle / gland • response described – muscle contracts / gland secretes hormone		6	AO1 4.5.1
03.1	Y – cerebellum Z – medulla		1 1	AO2 4.5.2.2
03.2	cerebral cortex label = **X**	accept cerebrum	1 1	AO2 4.5.2.2
03.3	MRI scan		1	AO1 4.5.2.2

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03.4	the brain is very complex – it is not known fully how it works the brain is very delicate surgery may result in damage to another area many drugs will not pass from the blood into the brain / cross the brain membrane		1 1 1 1	AO1 4.5.2.2
04.1	sensory neurone		1	AO2 4.5.2.1
04.2	0.012 s	award 1 mark for $\frac{0.9\text{ m}}{76\text{ m/s}}$ award 2 marks for 12 ms	3	AO2 4.5.2.1 MS 1c, 3d
04.3	contains (2) synapses electrical impulse triggers a chemical / neurotransmitter to be released this diffuses across the synapse / between the two neurones slower than electrical impulse		1 1 1 1	AO2 4.5.2.1
05.1	**A** **H** **B** and **D**		1 1 1	AO1 4.5.2.3

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Question	Answers	Extra information	Mark	AO / Specification reference
05.2	the iris will contract reducing the size of the pupil / aperture reducing the amount of light entering the eye / preventing damage to the light-sensitive (retinal) cells		1 1 1	AO1 4.5.2.3
05.3	any **four** from: • when focused on the distant tree, the ciliary muscles are relaxed • the suspensory ligaments are pulled tight • causing the lens to be pulled thin, meaning little refraction occurs • meaning the (approximately parallel) rays from the distant object are focused on the retina • the reverse process takes place when the focus moves to the nearby book	accept converse statements about focus on the nearby book	4	AO1 4.5.2.3
06.1	0.15 s	award 1 mark for $\frac{11.5}{490}$ award 2 marks for 0.153 s	3	AO2 4.5.2.1 MS 1c, 3d

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Question	Answers	Extra information	Mark	AO / Specification reference
06.2	any **four** from: • give student caffeine / coffee drink • wait 15 minutes / sensible time period • at least two named control variables, e.g. drop from same height, use same person each time, use same hand to catch ruler • drop ruler; note drop distance • repeat (at least) five times and calculate mean drop distance		4	AO2 4.5.2.1
06.3	reaction time would be faster / shorter caffeine is a stimulant it speeds up body reactions / the nervous system		1 1 1	AO2 4.5.2.1

Question	Answers	Extra information	Mark	AO / Specification reference
06.4	any **three** from: supporting conclusion: • person A and person **b** both reacted more quickly when using their dominant hand • the pattern was consistent with both sets of data casting doubt on conclusion: • differences between results are very small and could be attributed to experimental error • only two students were tested / sample size was very small • only two results were collected for each hand • there appears to be a 'learned' effect – the second repeat result is always lower than the first for each hand evaluation: • the student should not form a general conclusion based on these data	to gain 3 marks, answers should include at least one marking point to support the conclusion and at least one marking point to cast doubt on the conclusion	3 1	AO3 4.5.2.1

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07	any **six** from: • noise detected by sound receptor • sends an electrical impulse • along sensory neurone • to a relay neurone • in central nervous system (CNS) • sends an impulse along motor neurone • to muscle in leg • muscle contracts, making person jump		6	AO2 4.5.2.1
08.1	stimulus		1	AO2 4.5.1 4.5.2.1
08.2	brain		1	AO2 4.5.1 4.5.2.1
08.3	driver would have reacted faster to the insect as responded with a reflex action brain not involved / impulse relayed via CNS		1 1 1	AO2 4.5.2.1
09.1	sensory neurone		1	AO1 4.5.2.1

Question	Answers	Extra information	Mark	AO / Specification reference
09.2	any **six** from: • pain receptor sends an electrical impulse along the sensory neurone • this triggers the release of chemical / neurotransmitter from the end of the sensory neurone • this diffuses across the synapse • procaine is the same shape as chemical / neurotransmitter • procaine binds to receptor on the next neurone / post synaptic membrane • chemical cannot bind • no electrical impulse / action potential is generated • impulse does not travel to the brain • so no pain is detected / felt	credit higher-level knowledge of synapses and terminology	6	AO3 / AO2 4.5.2.1
10.1	the process of changing the shape of the lens to focus on nearby or distant objects		1	AO1 4.5.2.3
10.2	diagram of eye showing clearly convex-shaped lens refraction at cornea refraction at lens causing rays to converge before retina		1 1 1	AO2 4.5.2.3

Question	Answers	Extra information	Mark	AO / Specification reference
10.3	concave lens placed in front of the eye light rays caused to diverge / converge less before passing through the cornea light rays converging on retina		1 1 1	AO2 4.5.2.3
10.4	either: • lens becomes stiffer / less elastic • which makes it more difficult for the lens to change shape • ciliary muscles need to contract more to change lens thickness • (if force supplied is too small) means light focuses behind the retina / light cannot be brought to focus on the retina or: • suggest ciliary muscles can no longer contract as efficiently • so suspensory ligaments still pull on lens • lens shape does not change to required thickness • so light focuses behind the retina / light cannot be brought to focus on the retina		 1 1 1 1 or: 1 1 1 1	AO3 4.5.2.3

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Question	Answers	Extra information	Mark	AO / Specification reference
11.1	receptor AND effector	answers must be in this order	1	AO1 4.5.2.1
11.2	spinal cord		1	AO1 4.5.2.1
11.3	any **two** from: • sensory neurones carry information to the brain / CNS, motor neurones carry information from the brain / CNS (to other parts of the body) • sensory neurones have their cell body along one side of the axon, motor neurones have their cell body at one end of the axon • sensory neurones receive information from receptors, motor neurones transmit information to effectors / muscles / glands		2	AO1 4.5.2.1
11.4	any **two** from: • the senses • the speed of the impulse travelling to the brain • the processing time in the brain • the speed of the impulse sent to the muscles		2	AO2 4.5.2.1
12.1	body reactions would slow as enzyme-controlled reactions / respiration would occur more slowly	accept any two symptoms of hypothermia	1 1	AO2 4.5.2.4

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Question	Answers	Extra information	Mark	AO / Specification reference
12.2	any **six** from: • temperature change detected by temperature receptors • in the skin • in the thermoregulatory centre / hypothalamus • impulses sent to the skeletal muscles • to contract (and relax rapidly) / cause shivering • this requires lots of energy from respiration • heat produced as a result of exothermic reaction • vasoconstriction of capillaries • reduces blood flow to the skin surface • reduces heat loss by radiation • sweat production stopped / prevented		6	AO1 4.5.2.4
12.3	any **three** from: • body produces sweat • heat is lost when water in sweat evaporates • as air is humid, it has a high water content • so less water can evaporate from the athlete's body (so they cannot cool down)		3	AO3 4.5.2.4

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Question	Answers	Extra information	Mark	AO / Specification reference
13.1	Tom's Diner		1	AO2 4.3.1.1 4.3.1.3
13.2	any **two** from: • food could become contaminated as open to the air • 30 °C is not hot enough to kill most bacteria • bacteria likely to reproduce rapidly at 30 °C		2	AO2 4.3.1.1 4.3.1.3
13.3	any **one** from: • water • rest • antibiotics	accept any sensible suggestion	1	AO1 4.3.1.8
13.4	bacteria require moisture to reproduce		1	AO2 4.3.1.1 4.3.1.3

Question	Answers	Extra information	Mark	AO / Specification reference
13.5	any **four** from: • keep the person who has the disease in isolation which prevents spread through droplet infection / touching • clean surfaces with an antiseptic which kills / destroys the pathogen • wash hands when touching materials that have been in contact with contagious person to minimise risk of ingesting pathogen • wear gloves / mask / protective clothing to minimise risk of inhaling / ingesting pathogen	to award 4 marks, answers should include two suggested approaches and two explanations of how these minimise the risk of pathogen transmission	4	AO2 4.3.1.1 4.3.1.3
14.1	$6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$	award 1 mark for a correct but unbalanced chemical equation	2	AO1 4.4.1.1
14.2	large surface area to maximise the area onto which light falls, increasing the total energy received palisade cells / cells full of chloroplasts found near top of leaf so light is not lost travelling through many layers of the leaf / to increase the chance of incoming light being available for the process of photosynthesis		1 1 1 1	AO1 4.2.3.1

Question	Answers	Extra information	Mark	AO / Specification reference
14.3	any **six** from: • CO_2 diffuses through open stomata from a high to a low concentration at midday: • CO_2 diffuses from air spaces (in spongy mesophyll) into leaf cells for photosynthesis • this is replaced by CO_2 diffusing into the leaf through stomata (as concentration higher outside leaf than inside) • small amount of CO_2 produced by the leaf through process of respiration • net movement of CO_2 entering the leaf at midnight: • no light so photosynthesis not taking place • so CO_2 does not enter through guard cells as no concentration gradient • plant respires so CO_2 produced through respiration • increased concentration of CO_2 within leaf relative to outside • net movement of CO_2 leaving the leaf	to award 6 marks, students should discuss the net movement of CO_2 at midday and midnight, and explain reasons for both of these movements	6	AO2 4.4.1.2

Question	Answers	Extra information	Mark	AO / Specification reference
14.4	any **four** from: • stomata are located on the lower surface of a leaf to prevent water loss by evaporation • lilies have constant access to water (so water loss not an issue) • gas exchange occurs more efficiently in the air than through water • because gases diffuse more slowly through liquids than through other gases • carbon dioxide concentration is much lower in the water than in the atmosphere • so diffusion gradient lower • reducing diffusion rate		4	AO3 4.2.3.2