

AQA Style

GCSE

BIOLOGY

Higher Tier

Biology Paper 2

H

Mark Scheme



01.4	Level 2: Some logically linked reasons are given with at least one benefit to each method. For full marks there should also be a simple judgement.	3-4
	Level 1: Relevant points are made. They are not logically linked. Two relevant points awards two marks.	1-2
	No relevant content.	0
	Indicative content: Benefits of preimplantation genetic diagnosis: <ul style="list-style-type: none">• No (or less) chance of miscarriage as a result of the procedure.• Does not involve abortion/less pain or suffering for parents/ ethical reason against abortion.• Detected earlier so less chance for the embryo to have developed/reference to 3 days instead of 10 weeks.• Multiple embryos mean a higher chance of having an unaffected embryo.• Spare embryos mean you won't need to repeat the full procedure for a second child. Benefits of chorionic villus sampling: <ul style="list-style-type: none">• Lower cost to the NHS.• If the embryo is healthy or parents decide not to terminate, there will be no embryos destroyed.• Lower risk of false-positive result.	
Total		10



Question 2

Question	Answers	Extra information	Mark
02.1	receptor relay neurone motor neurone	Answers in this order only.	1 1 1
02.2	Any two from: <ul style="list-style-type: none">• chemical/neurotransmitter/ transmitter• passes the impulse from one neurone to the next• by diffusing (across the gap/synapse)		2
02.3	automatic/quick/fast/rapid response to protect the body/to protect from danger		1 1
02.4	12 (cm)		1
02.5	caffeine decreases reaction times	Allow caffeine speeds up reactions.	1
02.6	Any two from: <ul style="list-style-type: none">• use a better method for measuring reaction time (e.g. computer reaction timer)• more repeats of each test• repeat the test with more people• use the same distance between finger and thumb• use a ruler with a more precise scale (e.g. mm scale)	Ignore accurate.	2
Total			11



Question 3

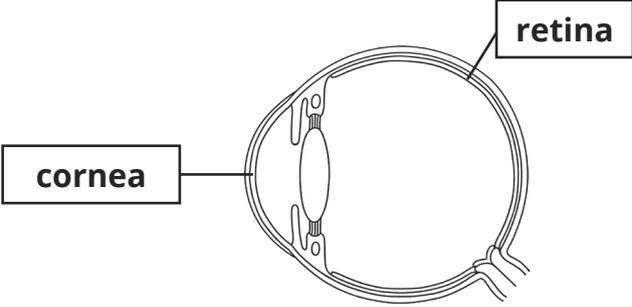
Question	Answers	Extra information	Mark
03.1	nucleus		1
03.2	fertilisation		1
03.3	23	Answers in this order only.	1
	46		1
03.4	Any four from: <ul style="list-style-type: none">• proteins are synthesised/made on ribosomes• a carrier molecule brings amino acids• specific to the template• three bases code for one amino acid• amino acids are added to the chain in the correct order/according to the template order• the chain folds up to form a 3D/unique shape		4
03.5	circle around G-T base pair	Allow circling of either base in the pair. Allow other method of highlighting if it is clear the student is referring to the correct base pair.	1
03.6	the change in the base means a different amino acid/protein		1
	the protein may have a different shape		1
	the enzyme/active site may no longer fit the substrate		1
Total			12



Question 4

Question	Answers	Extra information	Mark
04.1	11.5 (mmol/L)	Allow answers in the range of 11.4 to 11.6.	1
04.2	0.5 (hours)		1
04.3	insulin		1
04.4	the pancreas produces (the hormone) <u>glucagon</u>		1
	which causes glycogen to be converted into glucose and released into the blood		1
04.5	in Type 1 diabetes, not enough/no insulin is produced		1
	in Type 2 diabetes, the body cells no longer respond/are less responsive to insulin		1
	Type 1 diabetes is treated with insulin injections		1
	Type 2 diabetes is treated with a carbohydrate-controlled diet and/or exercise	Diet unclarified is not sufficient for the mark.	1
04.6	Any one from: adrenaline thyroxine	Allow any other correctly named hormone that is controlled by negative feedback.	1
04.7	glucose is filtered out of the blood		1
	then all the glucose is reabsorbed	Allow selective reabsorption only if it is clear that all of the glucose has been reabsorbed.	1
Total			12

Question 5

Question	Answers	Extra information	Mark
05.1	enzymes cut out the required gene from the daffodil		1
	the gene is inserted into a vector/ bacterial plasmid/virus		1
	the vector is used to insert the gene into the cells of the rice plant		1
	at an early stage of its development		1
05.2	<p>Any two from:</p> <ul style="list-style-type: none"> genetically modified crops could affect populations of wild plants and insects the effects of eating GM crops/golden rice on human health were unknown/ were not fully explored genetic engineering is unethical/ unnatural 		2
05.3	 <p>The diagram shows a cross-section of the human eye. A label 'cornea' points to the front surface of the eye. A label 'retina' points to the back surface of the eye. The lens and ciliary muscles are also visible in the center.</p>	<p>Award 1 mark for each correct label.</p> <p>If more than one line is drawn between the label and the diagram, do not award that mark.</p> <p>Allow correct labels at any position along the retina/ cornea.</p>	2
05.4	the ciliary muscles contract		1
	the suspensory ligaments loosen/relax		1
	the lens becomes thicker so light rays are refracted more		1



05.5	myopia	Allow short sight/ short-sightedness.	1
05.6	Any one from: <ul style="list-style-type: none">• spectacles/glasses• contact lenses• laser eye surgery• artificial lens implant		1
Total			13





Question 6

Question	Answers	Extra information	Mark
06.1	FSH causes maturation of an egg (in the ovary)		1
	LH stimulates the release of an egg		1
06.2	13		1
06.3	oestrogen levels increase which stimulates the release of LH		1
	progesterone levels increase which inhibits the release of LH		1
06.4	oestrogen and progesterone maintain the uterus lining		1
	when they are at their lowest levels, the uterus lining is shred/lost/no longer maintained		1
06.5	eggs are collected (from the mother)		1
	eggs are fertilised with sperm (from the father) <u>in the laboratory</u>	There must be a reference to fertilisation occurring outside the mother in a laboratory/petri dish/test tube or equivalent.	1
	the fertilised eggs develop into embryos		1
	one or two embryos are inserted into the mother's uterus/womb		1
06.6	Any one from: <ul style="list-style-type: none">• it is emotionally and/or physically stressful• the success rates are not high• it can lead to multiple births which are a risk to both the babies and the mother		1
Total			12

Question 7

Question	Answers	Extra information	Mark
07.1	correct shape 	Allow inverted pyramid if correctly labelled.	1
	all four bars correctly labelled	(Arctic) wolf (Arctic) tern krill phytoplankton or tertiary consumer secondary consumer primary consumer producer	1
07.2	$\frac{30}{400} \times 100$	Answer of 7.5 (%) with no working scores 2 marks.	1
	7.5 (%)		1
07.3	some of the biomass is used for respiration		1
	some of the biomass is lost as waste products/carbon dioxide/water/urea		1
	some of the biomass is lost as faeces/not all of the krill is digested		1
07.4	Any one from: <ul style="list-style-type: none"> • phytoplankton are too small to see • there are too many phytoplankton/krill to count/can't find them all • Arctic terns migrate/do not stay in one place 		1



07.5	(Arctic) hares could not find berries/ fewer berries grew		1
	the number of (Arctic) hares fell		1
	there was less food available for the (Arctic) wolves		1
07.6	Level 3: The method includes counting the number of plants and measuring the light intensity in more than one location. For full marks students must also include another valid statement.		5-6
	Level 2: The method includes counting the number of plants or measuring the light intensity in more than one location. For four marks the students must also include another valid statement.		3-4
	Level 1: The method includes counting the number of plants or measuring the light intensity in at least one location. Two marks can be given for two valid statements.		1-2
	No relevant content.		0
	Indicative content <ul style="list-style-type: none"> • Use of a tape measure to produce a transect down the hillside. • Quadrats placed; • at regular locations along the transect. • Counting of the number of berries in the quadrat. • Use of the light meter to measure light intensity in each quadrat. • Repetition of transect. • Repetition of light intensity measurement in each quadrat. • Calculation of the mean light intensity in each quadrat. • Calculation of the mean number of berries in each light intensity. • Relate the light intensity to the number of berries e.g. graph. 		
07.7	increase in temperature causes ice to melt		1
	polar bears can't hunt so have less food		1
	fewer polar bears/cubs/offspring survive	Allow warmer weather can cause dens to collapse.	1
Total			20



Question 8

Question	Answers	Extra information	Mark
08.1	phototropism		1
08.2	a cross on the right wall of the box		1
08.3	when the tips were removed the shoots did not respond/grow/bend towards the light		1
	when the tips were covered the shoots did not respond/grow/bend to the light		1
	because the light couldn't reach the tip		1
08.4	reference to auxin		1
	there is more hormone on the dark side of the shoot	Allow hormone/ auxin is unequally distributed.	1
	there is more growth on the dark side	Allow unequal growth (rates).	1
08.5	Any two from: <ul style="list-style-type: none">• auxins<ul style="list-style-type: none">- as weedkillers- as rooting powders- for promoting growth in tissue culture• ethene<ul style="list-style-type: none">- to control ripening of fruit• gibberellins<ul style="list-style-type: none">- to end seed dormancy- to promote flowering- to increase fruit size	The use given must be linked to the correct hormone to gain the mark.	2
Total			10