

Question	Answers	Extra information	Mark	AO / Specification reference				
01.1	B as the chromosomes are identical/the same size / XX		1 1	AO2 4.6.1.8				
01.2	nucleus		1	AO1 4.6.1.8				
01.3	<table border="1"> <tr> <td>XX</td> <td>XX</td> </tr> <tr> <td>XY</td> <td>XY</td> </tr> </table>	XX	XX	XY	XY		1 1	AO1 4.6.1.8
XX	XX							
XY	XY							
01.4	50% / 1 in 2	allow ½ or 1:1	1	AO1 4.6.1.8				
01.5	1/4		1	AO1 4.6.1.8				
02.1	mitosis		1	AO1 4.6.1.1				
02.2	C A E B D	award four marks for all statements in correct order award three marks for 3 or 4 statements correct award one or two marks for 1 or 2 correctly ordered statements respectively	4	AO1 4.6.1.1				
02.3	any two from: sexual reproduction: requires two parents	accept converse for any of the marks	2	AO1 4.6.1.1 4.6.1.2				

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	produces four gametes gametes produced are genetically different gametes mix / fuse / mixing of genetic material					
03.1	ovaries				1	AO1 4.6.1.2
03.2	testes				1	AO1 4.6.1.2
03.3	Feature	Meiosis	Mitosis	award one mark for each correct row	4	AO1 4.6.1.2
	Produces clones		✓			
	Produces four gametes	✓				
	Halves the number of chromosomes in a cell	✓				
	Cell divides once		✓			
04.1	23 46 alleles dominant				1 1 1 1	AO1 4.6.1.6

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	recessive		1	
04.2	BB – homozygous dominant Bb – heterozygous bb – homozygous recessive	all three correct for 2 marks One or two correct for 1 mark	2	AO1 4.6.1.6
04.3	BB – Brown eyes Bb – Brown eyes bb – Blue eyes		1 1 1	AO1 4.6.1.6
04.4	the baby may be born with brown eyes, or may be born with blue eyes		1	AO2 4.6.1.6
04.5	as the mother may be heterozygous for the eye colour gene		1	AO2 4.6.1.6
05.1	DNA is a polymer DNA is twisted into a helix		1 1	AO1 4.6.1.4
05.2	gene – section of DNA coding for a characteristic chromosome – long strand of DNA genome – entire genetic material found in an organism nucleus – part of a cell containing DNA	award three marks for 4 correctly matched definitions award two marks for 2 or 3 correctly matched definitions award one mark for 1 correctly matched definition	3	AO1 4.6.1.4
05.3	One from: Identify cause of genetic disease Identify possible treatment of inherited disorder	accept any other appropriate suggestion	1	AO3 4.6.1.4

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	study human migration patterns link genetic factors to a disease			
06.1	24		1	AO2 4.6.1.6
06.2	12		1	AO2 4.6.1.6
06.3	two parents are required gametes fuse together		1 1	AO1 4.6.1.6
06.4	Any four from: copies of the DNA / genetic information is made cell divides twice to form four gametes / pollen cells each with a single set of chromosomes each pollen cell is genetically different / non identical		4	AO2 4.6.1.2
07.1	polydactyly		1	AO1 4.6.1.7
07.2	it is caused by a recessive allele it affects cell membranes resulting in thick mucus being produced		1 1	AO1 4.6.1.7
07.3	ethical:	Award one mark for each statement matched	4	AO3

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	an unborn fetus has a 'right to life' social: enables parents to evaluate potential impact on their lives economic: allows a couple to consider whether they are able to financially support the child cost of procedure small compared with cost of lifetime care	correctly		4.6.1.7
08.1	(sperm contains) 23 (chromosomes) (egg contains) 23 (chromosomes) (during) fertilisation (the genetic material joins together) (cell divides by) mitosis (each nucleus in an embryo contains) 46 (chromosomes)		1 1 1 1 1	AO1 4.6.1.2
08.2	it involves two parents genetically different offspring are produced		1 1	AO1 4.6.1.1
08.3	pollen egg cell / ovule		1 1	AO1 4.6.1.1
09.1	polymer / chain of nucleotides two strands arranged as a double helix		1 1 1	AO1 4.6.1.4
09.2	specific sequence of amino acids		1	AO1

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	create a specific protein (which carries out a particular function)		1	4.6.1.4
09.3	the complete set of genes / genetic material present in a cell / organism		1	AO1 4.6.1.4
09.4	find genes linked to disease understand / design treatments for inherited disorders trace ancestry / human migration		1 1 1	AO1 4.6.1.4
10.1	ethanol carbon dioxide		1 1	AO1 4.4.2.1
10.2	independent variable – temperature dependent variable – volume of gas produced control variable – time over which gas is collected	award one mark for one correctly matched variable	2	AO2 4.4.2.1
10.3	all data points plotted correctly appropriate line of best-fit drawn (smooth)	1 mark for at least two data points plotted correctly	2 1	AO2 AO3 4.4.2.1 MS 4C
10.4	any two from: As temperature increases, rate of reaction / volume of gas produced increases until 40 °C after 40 °C rate of reaction decreases		2	AO3 4.4.2.1 MS 4a