

B2.4 Genome, Chromosomes, DNA & Genetics ~ HW booklet answers

1.

(a) Sugar; phosphate;	[2]	
(b) (i) Same A as T; Same G as C; More A-T than G-C; A greatest/C lowest; Other appropriate response; (Any three)	[3]	
(ii) 100 - 42; 58 ÷ 2 = 29;	[2]	[7]

2.

(a) (i) Any three from: Backbone same; [1] Double helix; [1] Made of sugar/deoxyribose and phosphate; [1] A pairs with T/C with G; [1]	[3]	
(ii) Different <u>sequences/order</u> of bases;	[1]	
(b) (i) C;	[1]	
(ii) Glycine replaced by arginine; [1] Different protein; [1]	[2]	7

3.

(a) Allele is a form of a gene/type of the same gene;	[1]	AVAILABLE MARKS
(b) (i) bb;	[1]	
(ii) Heterozygous;	[1]	
(iii) Punnett;	[1]	
(iv) 1:1;	[1]	
		5

4.

(a) Short length of DNA;	[1]	
(b) (i) RR; [1] Rr/rR; [1]	[2]	
(ii) Circle drawn around rr;	[1]	
(iii) Half/50%	[1]	5

5.	(a)	(Different) form of same(/a) gene;	[1]	
	(b)	rr;	[1]	
	(c)	Not shown in the first generation (phenotype);	[1]	
	(d)	(i) RR, Rr; Rr, rr;	[2]	
		(ii) Circle drawn around RR	[1]	6

6.	(a)	(i) Down syndrome;	[1]	AVAILABLE MARKS	
		(ii) Extra chromosome; chromosome 21;	[2]		
		(iii) 23 pairs of chromosomes;	[1]		
		(iv) (X and Y) chromosomes present;	[1]		
	(b)	(i) Amniotic fluid;	[1]		
		(ii) Amniocentesis;	[1]		
		(iii) Avoid damaging baby with syringe;	[1]		
		(iv) Should mother have abortion if baby has condition; risk of miscarriage; free choice whether to screen or not; (Any two)	[2]		
					10

7.	(a)	amniocentesis	[1]	
	(b)	nucleus;	[1]	
	(c)	Down syndrome;	[1]	
	(d)	Mutation;	[1]	
	(e)	Different genders (A male, B female)/different sex chromosomes/ A-XY B-XX/different numbers of chromosomes (described);	[1]	
	(f)	Abortion (for medical reasons); Risk of miscarriage (caused by screening);	[2]	7

8.	(a)	(i) One similar plasmid with insulin gene drawn inside bacterium;	[1]	
		(ii) Restriction [enzyme];	[1]	
		(iii) Exposed [DNA] bases on sticky ends (of gene); [1] Complementary/match to (bases in) cut in plasmid; [1] bind/bond together by base pairing; [1]	[3]	
		(iv) Any two from: Bacterium is grown/cultured/reproduces/in fermenter/biodigester; Bacteria all/each produce insulin;	[2]	
	(b)	X; [1] Activity reaches a maximum quickly; [1] Max = 7.1 arbitrary units in 96 minutes/1 hour 36 minutes/active for 5.4 hours; [1]	[3]	10