

Question number	Answer	Notes	Marks
1	<p>C ± GM / GM field and normal field / eq;</p> <p>O same species / size / mass / length / eq;</p> <p>R many plants / several fields / eq;</p> <p>M1 mass / length / surface area of leaves / count fruit / count flowers / eq;</p> <p>M2 <u>stated</u> time period;</p> <p>S1 and S2 same temp. / light intensity / carbon dioxide / water / mineral ions / soil / exposure to pests / eq;;</p>	<p>M1 ignore yield</p> <p>M2 one day plus</p>	6

Total 6 marks

Question number	Answer	Notes	Marks
2 (a) (i)	<u>plasmid</u> ;		1
(ii)	restriction / endonuclease; ligase;		2
(b)	C different temps / range of temps; O same species / same bacteria / mass / amount / number of bacteria; R repeat; M1 measure insulin; M2 concentration / mass / volume; S1 + S2 same pH / food / oxygen / time period / type of fermenter / sterile / eq;;	ignore light / carbon dioxide	6

(Total for Question = 9 marks)

Question number	Answer	Notes	Marks
3	restriction (enzyme); <u>human</u> DNA / gene / allele; ligase; use <u>same</u> restriction enzyme; plasmid; <u>recombinant</u> (DNA/plasmid); <u>vector</u> ; insulin / factor VIII / named protein;	reject lipase	Max 5
		Total	5

Question number	Answer	Notes	Marks
4(a)(i)	none / zero / 0 / 0mg;		1
(ii)	increase / eq;		1
(b)(i)	lots of cows / group / eq;	repeat not qualified = 0	1
(ii)	<ol style="list-style-type: none"> 1. species / breed / type of cow / eq; 2. age / mass / size; 3. food / grass / eq; 4. water; 5. (air) temperature; 	Ignore gender Ignore number in group Ignore conditions / environment	2 max
(c)(i)	<u>denatured</u> ;	Ignore broken down / stops working / active site changes shape Reject killed	1
(ii)	<ol style="list-style-type: none"> 1. <u>HCl</u> / <u>hydrochloric acid</u>; 2. enzyme / protease / pepsin; 3. breakdown / digest; 4. (acid) <u>denatures</u> growth hormone; 	Mp1 Ignore low pH / acid	3

(d)	1. gene / allele / DNA for growth hormone ; 2. restriction (endonuclease); 3. ligase; 4. plasmid; 5. vector; 6. recombinant;		4 max
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