

Question number	Answer	Notes	Marks
1 (a) (i)	pancreas;	allow pancrease	1
(b)	1. lower / reduce / regulate / maintain / control / eq; 2. <u>blood</u> sugar / <u>blood</u> glucose; 3. lycogen;	blood glucose to glycogen = 2 excess glucose to glycogen =1 released when glucose levels are high = 1	2
(c) (i)	1. <u>human</u> gene / <u>human</u> DNA / <u>human</u> allele; 2. restriction / endonuclease; 3. <u>plasmid</u> ; 4. <u>vector</u> ; 5. <u>same</u> restriction enzyme; 6. recombinant; 7. ligase;	gene for insulin = 0 human gene for insulin = 1	5
(ii)	D - transgenic;		1
(d) (i)	1. oxygen / aerobic ; 2. respiration;		2
(ii)	1. less/no insulin / less production; 2. fewer bacteria / kill bacteria / eq; 3. enzymes; 4. (not) optimum pH; 5. denatured / changed active site / destroyed;		4

(Total for Question = 15 marks)

