Question number	Answer	Notes	Marks
1 (a)	1. select high milk yield cow/mother/cattle/ones/ male on basis of mother's or daughters milk yield / eq; 2. breed / reproduce / mate / eq; 3. use offspring with high milk yield; 4. repeat process / many generations / eq;	Allow two cows with high milk yield	3
(b) (i)	uterus / womb;		1
(ii)	1. identical / no variation / all have same characteristic / eq; 2. faster process / quicker process / eq; 3. ore produced; 4. no need for mating / no need for two parents / no need to keep bull / no need to keep female / eq;	more that are identical = 2 ignore yield ignore cost	3
(c)	genetically; identical;	same DNA = 2	2
(d)	mitosis;		1

(Total for Question 6 = 10 marks)

Question number	Answer	Notes	Marks
2 (a)	1 human gene / human DNA / human allele; 2 restriction enzyme; 3 plasmid; 4 vector; 5 same restriction enzyme; 6 ligase; 7 recombinant plasmid / recombinant DNA;	allow gene that codes for growth hormone	Max 5
(b) (i)	released from gland / endocrine; travels in blood; to target (cells/organs) / eq; effect / response / coordination / controls / causes change / eq;	allow described effect	2
(ii)	1 cow with high milk yield / eq; 2 male/bull with high milk yield daughters or high milk yield mother / eq; 3 reproduce / mate / breed / AI / eq; 4 repeat process with high milk yield offspring / many generations / eq;	cows with high yield milk are allowed to reproduce = 2 use sperm from bull	Max 3
		Total	**10**

Question number	Answer	Marks
3 (a) (i)	humans / farmers (select organisms) / eq; desired features / characteristics / named feature / eq; mate / breed / reproduce / cross / AI / eq; repeat / several generations / select offspring / eq;	4
(ii)	short stem / eq; wheat / eq;	2
(b)	humans not involved / animals choose / eq; 'fittest' survive / best adapted / competition / eq; more generations involved / slower process; role of chance / random / mutation / eq; speciation / evolution / eq;	Max 2

Total 8 Marks

Question number	Answer	Notes	Marks
4 (a)	S scale linear + use of at least half grid; L lines on bars neat; A axes correct way; A axes labelled energy + kJ per m^2 per year and A,B,C,D / eq; P bars at correct height;	L lost if points plotted allow yr or y for year allow kJ m^{-2} yr^{-1}	5
(b)	temperature / heat; (sun)light / light intensity; wavelength / colour; water / rain; minerals / ions / salts / named mineral / nutrients;	ignore humidity	3
(c) (i)	(less) pests / disease control / pesticides / eq; biological control / predators; fertiliser / fertile soil / crop rotation / legumes / eq; irrigation / watered; replanting / several plantings per year; GM / species of plant / different strains / eq; weed removal;	ignore pollution / CO_2 levels or other abiotic factors ignore glasshouse / polythene	2
(ii)	man / human / you / farmer; desired characteristic / named feature / eq; breed / produce offspring / eq; many generations / eq;		4
(d)	several / use more than one / sample / repeat / eq; random; weigh / method of weighing / scales / eq; remove animals / consumers / soil; multiply to total area / scaling;	allow if implicit ignore count / measure biomass ignore average	Max 4
		Total	18