Cloning MS

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)	any four from: •nucleus / DNA / chromosomes / genetic material removed (from egg) •from (unfertilised) egg / ovum •nucleus from body cell of champion (cow) •inserted into egg / ovum •electric shock •to make cell divide or develop into embryo •(embryo) inserted into womb / host / another cow	allow 'empty egg cell' for first two marks do not allow fertilised egg allow egg from champion cow allow this point if wrong method eg embryo splitting	4
b)	any four from: Pros: •economic benefit eg increased yield / more profit •clone calf not genetically engineered •genetic material not altered •milk safe to drink / same as ordinary milk	max 3 marks	4
	Cons: •consumer resistance •caused by misunderstanding process •not proved that milk is safe •ethical / religious argument •reduce gene pool / eg	max 3 marks	
	Conclusion: sensible conclusion for or against, substantiated by information from the passage and / or own knowledge	ignore 'God would not like it' or 'it's not natural' conclusion at end	1
Total marks			9

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)	two species / types involved		1
b)	any three from:	full marks only if at least one pro,	3
		one con and an attempt at a	
	pros (max two pros)	conclusion	
	useful if species difficult to		
	breed		
	prevents extinction / continues		
	genetic line		
	cons (max two cons)		
	? low success rate or figures		
		ignore reference to ethical issues	
	given	/ cruelty	
	② development problems		
	② diverts attention from habitat		
	conservation / poaching /		
	pollution / climate change		
	? cloning reduces gene pool	must include references to both	
	conclusion	pros and cons and must be at end	
	argued conclusion	of answer	1
Total marks			5

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)	Remove egg cell from ovary 3 The egg cell is now empty 2 The egg cell now has the nucleus of a body cell. 4 Cloned animal	four correct gains 3 marks two or three correct gains 2 marks one correct gains 1 mark accept correct connection between statement and box	3
Total marks			3

QUESTION	ANSWE	ANSWER EXTRA INFORMATION			MARKS	
a)	7(b) Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should also refer to the information on page 2, and apply a 'best-fit' approach to the marking.			6		
	0 marks	Level 1 (1–2 marks)	Lev	el 2 (3–4 marks)	Level 3 (5–6 marks)	
	No relevant content	There is simple description of the early stages of adult cell cloning. However there is little other detail and the description may be confused or inaccurate.	comple the ear proces some a stages may sh	s an almost ete description of ly stages of the s and description of espects of the later The description ew some confusion curacies.	There is a clear, detailed and accurate description of all the major points of how adult cell cloning is carried out.	
	 Examples of Biology points made in the response could include: 6 skin cell from zorse (unfertilised) egg cell from horse remove nucleus from egg cell take nucleus from skin cell put into (empty) egg cell (then give) electric shock 					
	(causes) egg cell divides / embryo formed					
	(then) place (embryo) in womb / uterus					
Total marks						6

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)	joining		
	sexual		
	identical		
	asexual		
	clones		
Total marks			5

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)	asexual reproduction / mitosis or no fusion of gametes or division after fusion or from fertilised egg or from same embryo or from same egg and sperm each embryo has identical genetic information / genes / DNA / chromosomes	ignore cloning	1
b)	any two from: • experimental subject and control are identical or fair test since monkeys identical • monkeys similar to humans, so effect of drugs likely to be similar • all identical so will have same reaction to drugs / disease • it's better than catching wild ones	allow closely related so ignore evolved from	2
Total marks			4

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
а)	Adult cell Cells from Embryo Genes are A nucleus	all three correct = 3 marks two correct = 2 marks one correct = 1 mark extra line from a statement cancels the mark	3
Total marks			3

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)	genetically identical / same DNA /	gains 2 marks	2
	same chromosomes	accept identical without reference	
		As assetic mechanish for 4 months	
		to genetic material for 1 mark	
b)	remove nucleus from egg	allow use empty egg cell	1
	insert genetic material / nucleus /	do not allow if reference to sperm	1
	DNA / chromosomes from frozen		
	mouse		
	electric shock or allow to divide		1
	or insert into womb / uterus		
c)	ethical / religious / emotional	ignore playing God / unnatural /	1
	reasons	immoral	
	or		
	not known if it is safe / long term		
	effects not known		
Total marks			6