



Question number	Answer	Notes	Marks
1(a)	1. explants; 2. small pieces of tissue / small pieces of plant / eq; 3. agar / jelly; 4. contains nutrients / amino acids / glucose; 5. plant hormones / named hormone / eq; 6. minerals / named mineral; 7. sterile; 8. control light; 9. control humidity;		Max 5
(b)	1. quick / eq; 2. many produced; 3. any time of year; 4. no <u>genetic</u> variation / <u>genetically</u> identical / produce clones;	Allow converse	Max 2

**Total 7 marks**



Question number	Answer	Notes	Marks
2	1. e (cell) nucleus removed / enucleated / eq; 2. b y cell nucleus inserted / adult cell nucleus inserted / eq; 3. e ctricity / electric shock; 4. ll division / mitosis; 5. e _ryo; 6. uterus / womb ; 7. s _rogate (mother);	Ignore fetus	5
			Total 5 marks



Question number	Answer	Notes	Marks														
3 (a)	<table border="1"><thead><tr><th>Illness</th><th>Organ needed to cure illness</th></tr></thead><tbody><tr><td>uremia</td><td>(kidney)</td></tr><tr><td>emphysema</td><td>lung(s)</td></tr><tr><td>coronary failure</td><td>heart;</td></tr><tr><td>diabetes</td><td>s;</td></tr><tr><td>hepatitis</td><td>liver;</td></tr><tr><td>poor vision</td><td>cornea(s);</td></tr></tbody></table>	Illness	Organ needed to cure illness	uremia	(kidney)	emphysema	lung(s)	coronary failure	heart;	diabetes	s;	hepatitis	liver;	poor vision	cornea(s);		5
	Illness	Organ needed to cure illness															
	uremia	(kidney)															
	emphysema	lung(s)															
	coronary failure	heart;															
	diabetes	s;															
	hepatitis	liver;															
poor vision	cornea(s);																
(b)	ble; emulsifies / large drops to small drops / eq; neutralise / optimum pH / alkaline;		2														
(c) (i)	genetically / gene / allele / DNA; identical / same / eq;	ignore similar	2														
	(ii) lots / no shortage / no delay / better supply / always available / eq;  no rejection / match / accepted by body / eq;  no problems with relatives / eq;	allow ref to blood type	2														

TOTAL 11 MARKS

Question number	Answer	Notes	Marks
4	<p>C different temperatures / range of temperatures;</p> <p>O same species / same age of egg / same donor / eq;</p> <p>R repeat / lots of eggs / eq;</p> <p>M1 count / number that survive / number that divide / percentage survival / number alive / count viable eggs / eq;</p> <p>M2 leave for same stated time / measure time they survive;</p> <p>S1 same volume solution / same concentration of solution / same nutrients in solution / same type of solution / eq;</p> <p>S2 same oxygen / sterile / pH / eq;</p>	<p>ignore see which survived the best M1 and M2 must indicate quantitative measurement</p> <p>ignore same nutrient solution / same amount</p> <p>ignore light intensity</p>	<p>Max 6</p>

Total 6 marks

Question number	Answer	Notes	Marks
5	1. identical; 2. explant; 3. sterile; 4. microorganisms / fungi / bacteria / microbes / viruses / pathogens; 5. growth / nutrient / culture; 6. carbohydrate / sugar / sucrose / glucose / starch; 7. chlorophyll / chloroplast; 8. <u>nitrate</u> ; 9. large(r) / great / high / many / more / mass / big / eq; 10. any / different;	2. ignore utting 3. gnore clean 4. gnore disease / infection 5. ignore agar / jelly	10

Total 10 marks

Question number	Answer	Notes	Marks
6	1. <u>nucleus</u> from (adult) sheep put into empty egg cell / enucleated egg cell / eq;  2. electricity;  3. mitosis / cell division;  4. embryo;  5. uterus / womb;  6. <u>surrogate</u> ;	Mp1 ignore DNA / gene / plasmid	max 5

Total 5 marks



Question number	Answer	Notes	Marks								
7 (a)	<table border="1"><thead><tr><th>event</th><th>stage</th></tr></thead><tbody><tr><td>Cell division produces an embryo</td><td>6;</td></tr><tr><td>An embryo is put into a surrogate mother</td><td>7;</td></tr><tr><td>An egg cell is collected from a female sheep</td><td>3;</td></tr></tbody></table>	event	stage	Cell division produces an embryo	6;	An embryo is put into a surrogate mother	7;	An egg cell is collected from a female sheep	3;		3
	event	stage									
	Cell division produces an embryo	6;									
	An embryo is put into a surrogate mother	7;									
An egg cell is collected from a female sheep	3;										
(b)	C (R);		1								
(c)	D (P and R);		1								

(Total for Question = 5 marks)