

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. egg (cell) nucleus removed / enucleated / eq; 2. body cell nucleus inserted / adult cell nucleus inserted / eq; 3. electricity / electric shock; 4. cell division / mitosis; 5. <u>embryo</u> ; 6. uterus / womb ; 7. <u>surrogate</u> (mother);	Ignore fetus	5
			Total 5 marks

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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>pancreas;</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	pancreas ;	hepatitis	liver;	poor vision	cornea(s);		5
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(b)	bile; 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

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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 cutting 3. ignore clean 4. ignore 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

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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
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(b)	C (R);		1								
(c)	D (P and R);		1								

(Total for Question = 5 marks)