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 genetic variation / genetically 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

<table>
<tr><th>Question number</th><th>Answer</th><th>Notes</th><th>Marks</th></tr>
<tr><td>3 (a)</td><td>
<table>
<tr><th>Illness</th><th>Organ needed to cure illness</th></tr>
<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>
</table>
</td><td></td><td>5</td></tr>
<tr><td>(b)</td><td>b le;
emulsifies / large drops to small drops / eq;
neutralise / optimum pH / alkaline;</td><td></td><td>2</td></tr>
<tr><td>(c) (i)</td><td>genetically / gene / allele / DNA;
identical / same / eq;</td><td>ignore similar</td><td>2</td></tr>
<tr><td>(ii)</td><td>lots / no shortage / no delay / better supply / always available / eq;

no rejection / match / accepted by body / eq;

no problems with relatives / eq;</td><td>allow ref to blood type</td><td>2</td></tr>
</table>

TOTAL 11 MARKS

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

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. nucleus from (adult) sheep put into empty egg cell / enucleated egg cell / eq; 2. electricity; 3. mitosis / cell division; 4. embryo; 5. uterus / womb; 6. surrogate;	Mp1 ignore DNA / gene / plasmid	max 5

Total 5 marks

<table>
<tr><th>Question number</th><th>Answer</th><th>Notes</th><th>Marks</th></tr>
<tr><td>7 (a)</td><td>
<table>
<tr><th>event</th><th>stage</th></tr>
<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>
</table>
</td><td></td><td>3</td></tr>
<tr><td>(b)</td><td>C (R);</td><td></td><td>1</td></tr>
<tr><td>(c)</td><td>D (P and R);</td><td></td><td>1</td></tr>
</table>

(Total for Question = 5 marks)