Question Number	Answer	Mark
1 (a) (i)	B ;	**(1)**

Question Number	Answer	Mark
1 (a) (ii)	C ;	**(1)**

Question Number	Answer	Mark
1 (a) (iii)	A ;	**(1)**

Question Number	Answer	Mark
1(b)	<table><tr><th>**Features**</th><th>**Totipot stem cell**</th><th>**Pluripotent stem cell**</th></tr><tr><td>Can give rise to totipotent stem cells</td><td>✓</td><td>×</td></tr><tr><td>Can give rise to differentiated cells</td><td>✓</td><td>✓</td></tr></table> Any two correct for 1 mark	**(2)**

Question Number	Answer	Mark
***1 (c) QWC**	QWC – Spelling of technical terms *(shown in italics)* must be correct and the answer must be organised in a logical sequence) 1. idea of correct stimulus e.g. chemical ; 2. (causes) {some genes active / some inactive} (in bone marrow stem cell) / eq ; 3. only the active genes are transcribed / eq ; 4. (because) mRNA made (only at active genes) / eq ; 5. protein made / eq ; 6. which (determine / eq) cell {structure / function} / permanently modifies cell / eq ;	**max (4)**

Question Number	Answer	Mark
2 (a) (i)	xylem (tissue/vessels) / eq ;	**(1)**

Question Number	Answer	Mark
2 *(a)(ii) QWC	(QWC – Spelling of technical terms *(shown in italics)* must be correct and the answer must be organised in a logical sequence) Allow any pair for each of the following Water transport: 1. hollow tubes / no living contents / end walls broken down / eq ; 2. idea of allow movement of water e.g. columns of water / vertical movement 3. ref to waterproof material / eq ; 4. idea that keeps water in the vessel e.g. less water lost 5. (pores / eq} ; 6. to allow sideways movement of water /eq ; Support: 7. ref. to {lignin / extra cellulose} ; 8. for strength ; 9. ref to {rings / spirals / eq} ; 10. for strength / flexibility ;	**maximum (4)**

Question Number	Answer	Mark
2 (b)	1. ref to correct stimulus e.g. chemical ; 2. some genes {switched off / switched on / eq} ; 3. mRNA from {switched on / eq} genes ; 4. mRNA translated / eq ; 5. idea of {protein synthesised / different proteins produced} ; 6. which (permanently) modify cell (to become specialised) /description of a modification / eq ;	**maximum (3)**

Question Number	Answer	Mark
2 (c)	1. ref to {sample / explants} from both (tissues) ; 2. ref to aseptic conditions / named example ; 3. grow cells into a callus / eq ; 4. ref to growth regulators / eq ; 5. ref to {cells / tissue} can differentiate / cells can become {whole plants / eq} ; 6. ref to details of procedure e.g. agar / leave for a suitable length of time / suitable controlled variable ;	**maximum (4)**

Question Number	Answer	Mark
3(a)	1. protein release from ribosome /eq ; 2. enter the rER {lumen / eq} ; 3. becomes packaged into (rER) vesicles ; 4. (vesicles / proteins) move to Golgi (apparatus) / {vesicles fuse with / protein enters} Golgi ; 5. protein {modified / carbohydrate added / named carbohydrate added} / eq ; 6. then become packaged into (secretory) vesicles / eq ; 7. glycoprotein becomes part of (vesicle) membrane ; 8. vesicles {move towards / fuse with} the cell (surface) membrane ;	**max (5)**

Question Number	Answer	Mark
3(b)(i)	1. totipotent (stem cells) can give rise to {all / any / 216} cell types / eq ; 2. (stem cells) are {undifferentiated / unspecialised} / eq ; 3. can keep dividing / eq ;	**max (2)**

Question Number	Answer	Mark
3(b)(ii)	they can {give rise to / eq} white blood cells / eq ;	**(1)**

Question Number	Answer	Mark
3(b)(iii)	possible route to {infection / eq} / rejection by recipient / increased chance of becoming cancerous /eq ;	**(1)**