Question Number	Answer	Mark
1 (a)	1. rate is same for up to 30 minutes / eq ; 2. faster (uptake) for A than B / eq ; 3. (uptake of) A is linear throughout whereas (uptake of) B is not / eq ; 4. uptake of substance B levels off at {2 to 2.2} hours whereas uptake of A does not / eq ; 5. credit correct manipulation of comparative figures ;	**maximum (3)**

Question Number	Answer	Mark
1* (b) QWC	(QWC – Spelling of technical terms *(shown in italics)* must be correct and the answer must be organised in a logical sequence) 1. correct ref to diffusion (of substance B) occurring due to concentration difference / eq ; 2. idea of rate of uptake decreases ; 3. as the concentration gradient decreases / eq ; 4. (net) uptake stops / eq ; 5. when concentration inside cell equals that outside the cell / eq ;	**maximum (4)**

Question Number	Answer	Mark
1 (c)	1. active transport is {against /eq} concentration gradient /eq ; 2. active transport requires ATP /eq ; 3. ref to involvement of (membrane) proteins in active transport ;	**maximum (2)**

Question Number	Answer	Mark
2(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
2(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
2(b)(ii)	they can {give rise to / eq} white blood cells / eq ;	**(1)**

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

Question Number	Answer	Additional Guidance	Mark
3(a)	correct answer only gains both marks 1. 2.2 – 7.6 = 24.6 ; 2. (÷ 32.2) × 100 = 76.4 / 76. 40 ;	 **ACCEPT 7.6** ÷ 32.2 100 – 23.6 = 76.4 / 76.40	**(2)**

Question Number	Answer	Additional Guidance	Mark
3(b)	1. idea of producing liquid extract of cabbage; 2. description of titration ; 3. reference to use of DCPIP ; 4. correct colour change described ; 5. compare volumes with standard e.g. reference to use of calibration curve / eq ; 6. description of appropriate standardisation of extract e.g. mass of cabbage, volume of liquid added to cabbage ;	 2. e.g. se volume of extract and find the volume of DCPIP needed or converse 4. e.g. it oes colourless when extract added, add DCPIP until it goes blue	**(4)**

Question Number	Answer	Additional Guidance	Mark
3(c)(i)	1. cell membranes {damaged / permeable / eq} ; 2. vitamin C leaves the {cells / cabbage} (because it is water soluble) ; 3. vitamin C is destroyed by {boiling / enzyme / ascorbic acid oxidase } ;		**(2)**

Question Number	Answer	Additional Guidance	Mark
3(c)(ii)	the { enzyme / ascorbic acid oxidase } would have been denatured (quicker when added to the boiling water) ;	**ACCEPT** for cold water: enzyme is more active as water is heated up or vitamin C leaks out as it heats up	**(1)**

Question Number	Answer	Additional Guidance	Mark
3(d)	1. idea that stored sauerkraut still contains some vitamin C. 2. cabbage would {rot / decompose / eq } ;	 **ACCEPT** sauerkraut does not rot	**(1)**

Question Number	Answer	Mark
4 (a)QWC	(QWC – Spelling of technical terms must be correct and the answer must be organised in a logical sequence) 1. *(gas exchange)* occurs through the {*cell membrane* / *phospholipid bilayer}* ; 2. idea that the *membrane* is thin ; 3. *oxygen* enters cell (from water) / eq ; 4. *carbon dioxide* leaves cell (into water) / eq ; 5. {O_2 / *oxygen* / CO_2 / *carbon dioxide*} are {small / *non-polar*} (*molecules)* ; 6. reference to *diffusion* ; 7. {reference to / description} (suitable) *concentration gradient* ; 8. reference to *large surface area (to volume ratio)* ;	**(4)**

Question Number	Answer	Mark
4 (b)	1. reference to diffusion (in the cytoplasm) ; 2. through the cytoplasm / description of part of cytoplasm / eq ; 3. down a concentration gradient (in the cytoplasm) / eq ;	**(2)**