Answers to examination-style questions

Answers			Marks	Examiner's tips
1	**a)**	cells can divide to form other types of cell	1	
	b)	to prevent rejection / immune response	1	
	c)	developed into heart muscle cells; reference to genes being expressed / switched on;	2	
	d)	small sample size / study needs to be repeated; long-term effect not known; 'improvement' not quantified;	2 max.	
2	**a)**	mitosis	1	
	b)	rapid process; large numbers can be produced; all genetically identical, so favourable characteristics can be maintained; sterile conditions, so 'disease-free';	2 max.	
	c)	cells are totipotent / can develop into any cell type; different genes expressed; related to relative concentration of growth regulators; different enzymes / proteins determine tissue formed;	4	
3	**a)**	cells can divide to form white blood cells; so restore ability to fight infections / replace existing faulty cells; *or* child's own cells; so no / little risk of rejection;	4	Two suitable reasons with explanations are required for maximum marks.
	b)	description of sigmoid curve; reference to specific time and event; few modified cells to start with / mainly non-functional white cells present; stem / modified cells replace non-functional cells / form new population of functional cells; levels off because number of white cells reaches the normal level;	3 max.	

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4	**a)**	less / no oestrogen binds to receptor; less / no receptors change shape; fewer / no transcriptional factors; less protein synthesis;	4	
	b)	**i)** small / 20–25 nucleotides; double-stranded (RNA);	2	
		ii) single siRNA strand; binds to mRNA; by complementary pairing; enzyme breaks down mRNA; prevents transcription (of certain genes);	4 max.	