Gene Expression - Mark Scheme

Q1.

Question Number	Answer	Additional Guidance	Mark
	An explanation that makes reference to the following: • interaction between transcription factors and promoter (region on gene) • RNA polymerase binds (to promoter region) (1) • { transcription /mRNA produced } (for insulin gene)	ALLOW 'regulatory' instead of 'promoter' or reference to transcription initiation complex ALLOW transcription initiation complex binds (to promoter region) if RNA polymerase described as part of the complex	**(3)**

Q2.

Question Number	Answer	Additional guidance	Mark
(a)(i)	1. an ethical comment ; 2. idea that no embryo used (as somatic cells are body cells) ; 3. limited supply of embryos /eq ; 4. iPS cells can be used in the same individual that provided the somatic cells ; 5. no immune response with iPS cells ;	All converse as appropriate 5. ACCEPT no rejection of cells, tissues	**(2)**

Question Number	Answer	Additional guidance	Mark
(a)(ii)	1. binds to another substance e.g. forming a transcription initiation complex, deactivating inhibitors ; 2. bind to promoter region(s) (on DNA) ; 3. so no genes switched off / eq ; 4. reference to RNA polymerase activity ; 5. (m)RNA production ; 6. {protein / eq} produced; 7. that allow cells to divide / undifferentiate / unspecialise ;		**(4)**

Question Number	Answer	Additional guidance	Mark
(b)	1. idea of same source of somatic cells used ; 2. example of measuring outcome offered e.g. percentage conversion to iPS, amount of mRNA or protein product made ; 3. use same time (for study) / eq ; 4. run at same temperature / eq ; 5. run at { same / optimum } pH ;	3 ACCEPT as time taken to produce iPS	**(3)**