

Question Number	Answer	Mark
3(a)(i)	13.1 ;	(1)

Question Number	Answer	Mark
3(a)(ii)	16.0 / 16 (%) ;	(1)

Question Number	Answer	Mark
3(a)(iii)	mitochondria / mitochondrion ;	(1)

Question Number	Answer	Additional Guidance	Mark
3(a)(iv)	1. idea of more sperm (cells) with defective flagella ; 2. idea that flagella needed to move sperm (cells) ; 3. idea of more sperm (cells) with defective mid-piece ; 4. idea that if mitochondria are affected there is no { respiration / energy / ATP } (for movement of flagella) ;	1. needs to be comparative ACCEPT only 4% in control 2. ACCEPT swim 4.ACCEPT damaged or fewer mitochondria ACCEPT less energy, less respiration or less ATP	(4)

Question Number	Answer	Additional Guidance	Mark
3(b)	<ol style="list-style-type: none"> 1. (acrosome contains) { acrosin / enzyme / eq } ; 2. Reference to acrosome reaction ; 3. idea that { zona pellucida / jelly layer } needs to be digested ; 4. sperm (cell) needs to { reach / fuse with } cell (surface) membrane of egg / eq ; 	3. ACCEPT broken down	(3)

Question Number	Answer	Additional Guidance	Mark
3(c)	<ol style="list-style-type: none"> 1. idea that smoking causes { damage to sperm / infertility} ; 2. idea of smoking as a variable to be controlled ; 3. idea of making sure that any effects were due to globozoospermia OR idea of difficulty in distinguishing between genetic and environmental factors ; 	3. e.g. difficult to tell if it was due to smoking or disease	(3)