Question Number	Answer		Mark
17(a)(i)	Use of $W = m\,g$ Use of Newton first law 6.9×10^{-8} (N) Example of calculation $W = 1.15 \times 10^{-8}$ kg $\times$ 9.81 N kg^{-1} = 1.13×10^{-7} N $D = W - U$ = 1.13×10^{-7} N − 4.37×10^{-8} N = 6.91×10^{-8} N	**(1)** **(1)** **(1)**	**3**
17(a)(ii)	Use of $F = 6\,\pi\,\eta\,r\,v$ [allow diameter for radius] Terminal velocity = 5.7×10^{-3} m s^{-1} (ecf from (a)(i)) ["show that" value gives 5.73×10^{-3} m s^{-1}] Example of calculation $D = 6\pi \times 1.41 \times 10^{-3}$ Pa s $\times$ 4.6×10^{-4} m $\times$ $v = 6.91 \times 10^{-8}$ N $v = 6.91 \times 10^{-8}$ N ÷ ($6\pi \times 1.41 \times 10^{-3}$ Pa s $\times$ 4.6×10^{-4} m) = 5.65×10^{-3} m s^{-1}	**(1)** **(1)**	**2**
17(b)	Viscosity increases (with lower temperature) so drag force increases (for given velocity) **OR** Viscosity increases (with lower temperature) so (terminal) velocity slower for given drag force [allow reference to $F = 6\pi\,\eta\,\rho\,v$] Density increases (with increasing depth) so upthrust increases [ignore "upthrust is constant"] Weight remains constant [do not accept "mass"] Terminal velocity reduces (with increasing depth) (dependent on MP1 or MP2) [accept "constant" velocity]	**(1)** **(1)** **(1)**	**4**
	Total for question 17		**9**