ANSWER SHEET FOR PART B

QUESTION NUMBER	ANSWERS	MARKS (examiner's use)
1 (i)	$\frac{R_2}{R_1} = 10^{-5}\left(\frac{1}{10^5}\right)$	05
(ii) (a)	$\omega_2 = 10^{10}\omega_1$	05
(ii) (b)	$T_2 = \frac{6}{10^{10}\omega_1}\left(\frac{6\times10^{-10}}{\omega_1}\right)$	05
(iii)	$B_2 = 10^8$ T	05
(iv)	$T_{\min} = 2\pi\sqrt{\frac{R^3}{GM}}$	10

2. (i) (a)	$p = 3.3\times10^{-19}$ kg m s^{-1}	02
(i) (b)	$E = 9.9\times10^{-11}$ J	02
(ii)	$n = 6.25(6.3)\times10^{10}$ electrons s^{-1}	05
(iii) (a)	$V = 9.0\times10^{-9}$ m^3	05
(b)	$n_{target} = 6.75(6.8)\times10^{20}$ nuclei	05
(iv)	$r = 2.25(2.3)\times10^{-4}$	05
(v)	$n_{collisions} = 1.4\times10^{7}$ collisions	06

(1) 3 (Three)
(2) 1 (One)
(3) 5 (Five)
(4) 4 (Four)
(5) 3 (Three)
(6) 5 (Five)
(7) 3 (Three)
(8) 4 (Four)
(9) 1 (One)
(10) 2 (Two)
(11) 1 (One)
(12) 1 (One)
(13) 3 (Three)
(14) 5 (Five)
(15) 4 (Four)
(16) 1 (One)
(17) 5 (Five)
(18) 5 (Five)
(19) 1 (One)
(20) 1 (One)