

Question number	Answer	Notes	Marks
7 (a)	opposite poles facing; held (very) close together;	reject if magnets described as touching	2
(b) (i)	arrow directed towards the centre of the circle in line with the position of the proton;	judge by eye  condone arrow that does not originate at the position of the proton	1
(ii)	correct diameter given to 1 significant figure = 1 mark; correct diameter given to 2 or 3 significant figures = 2 marks;;	6 (cm) 5.8-6.1 (cm)	2
(iii)	use of radius; dimensionally correct substitution into $v = 2 \times \pi \times r / T$ ; evaluation;  e.g. $r = (6.0 / 2 =) 3.0 \text{ cm}$ $v = 2 \times \pi \times 0.030 / 8.7 \times 10^{-6}$ ( $v =$ ) 22 000 (m/s)	allow ecf from (b)(ii)  -1 for POT error accept alternative method using $v = \pi \times d / T$  allow 21 000-22 000 (m/s)	3

Total for Question 7 = 8 marks