

P10 S 91

$$1) a = \frac{F}{m} = \frac{Eq}{m} = \frac{\cancel{870} (V/d) q}{m}$$

$$= \frac{(870/0.47) \times 1.6 \times 10^{-19}}{5.8 \times 10^{-27}}$$

$$5.8 \times 10^{-27} \times 1.67 \times 10^{-27}$$

$$= 5.5 \times 10^2 \text{ m/s}^2$$

$$s = ut + \frac{1}{2}at^2 = \frac{1}{2}at^2$$

$$t = \sqrt{\frac{s}{\frac{1}{2}a}} = \sqrt{\frac{0.47}{\frac{1}{2} \times 550}} = 4.13 \times 10^{-2} \text{ s}$$

$$3) a) \frac{1}{2}mv^2 = eV = 1.6 \times 10^{-19} \times 200 = 3.2 \times 10^{-17} \text{ J}$$

$$v = \sqrt{\frac{3.2 \times 10^{-17}}{\frac{1}{2} \times 206 \times 1.67 \times 10^{-27}}} = 1.36 \times 10^4 \text{ m/s}$$

$$mv = (206 \times 1.67 \times 10^{-27}) \times 1.36 \times 10^4 = 4.7 \times 10^{-21} \text{ kg m/s}$$

$$b) \frac{mv^2}{r} = Bqv \Rightarrow r = \frac{mv}{Bq} \quad (1)$$

$$r = \frac{206 \times 1.67 \times 10^{-27} \times 1.36 \times 10^4}{0.12 \times 1.6 \times 10^{-19}} = 0.24 \text{ m}$$

c) $\cos m$ is greater for uranium from 0 to ∞ .