

6 A sample of a radioactive isotope emits a beam of  $\beta^-$  radiation.

- (a) State the change, if any, to the number of neutrons in a nucleus of the sample that emits a  $\beta^-$  particle.

.....[1]

- (b) The number of  $\beta^-$  particles passing a fixed point in the beam in a time of 2.0 minutes is  $9.8 \times 10^{10}$ .

Calculate the current, in pA, produced by the beam of  $\beta^-$  particles.

current = ..... pA [3]

- (c) Suggest why the  $\beta^-$  particles are emitted with a range of kinetic energies.

.....  
 .....  
 .....  
 .....[2]

[Total: 6]



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