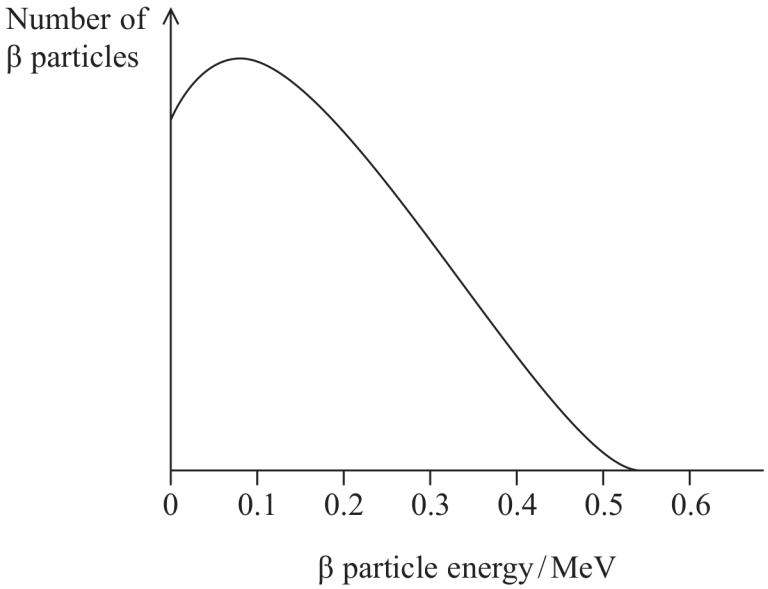
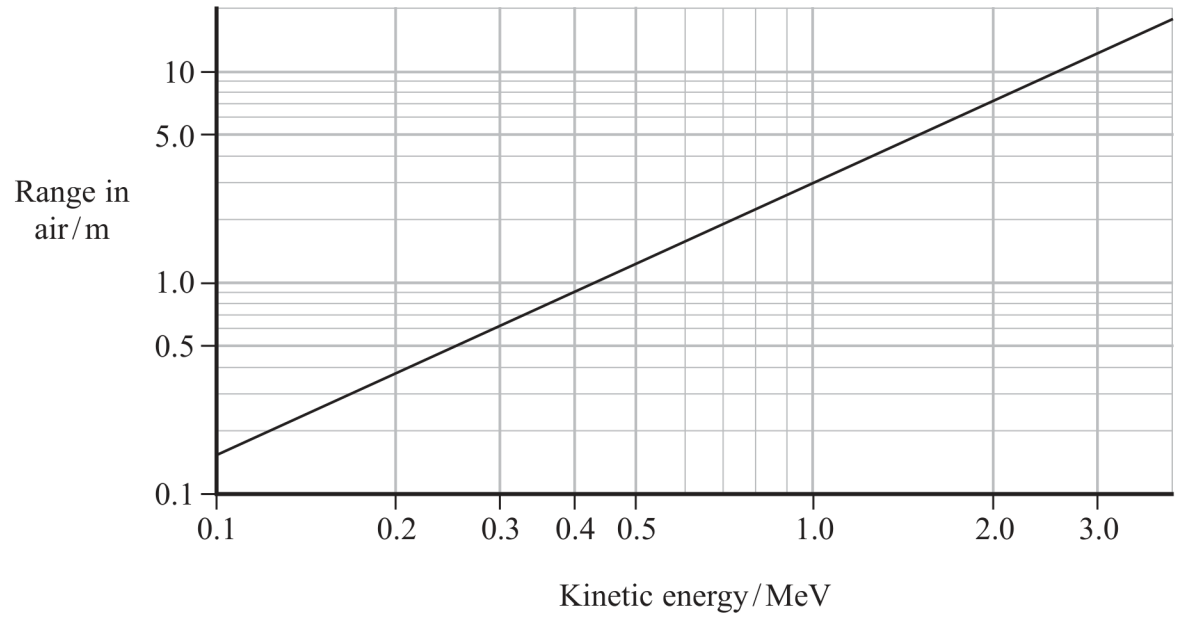
14 Strontium-90 is commonly used in schools to demonstrate the properties of β particles.

The range of energies of β particles emitted from a source of strontium-90 is shown below.



When β particles travel through air they ionise air molecules, which limits how far they travel. The range of the β particles depends upon their kinetic energy when released from the nucleus.

The graph below shows how the range of a β particle in air depends upon its kinetic energy.



It is estimated that the most energetic β particles from strontium-90 will ionise 250 nitrogen molecules per cm of air that they pass through.

15.6 eV is required to ionise a nitrogen molecule.

Assess whether this estimate is consistent with the range of these β particles in air.

(Total for Question 14 = 5 marks)