15 Alpha particles were chosen by Rutherford for large-angle scattering experiments.

(a) Explain why alpha particles are more suitable for these experiments compared to beta particles or gamma rays.

(3)

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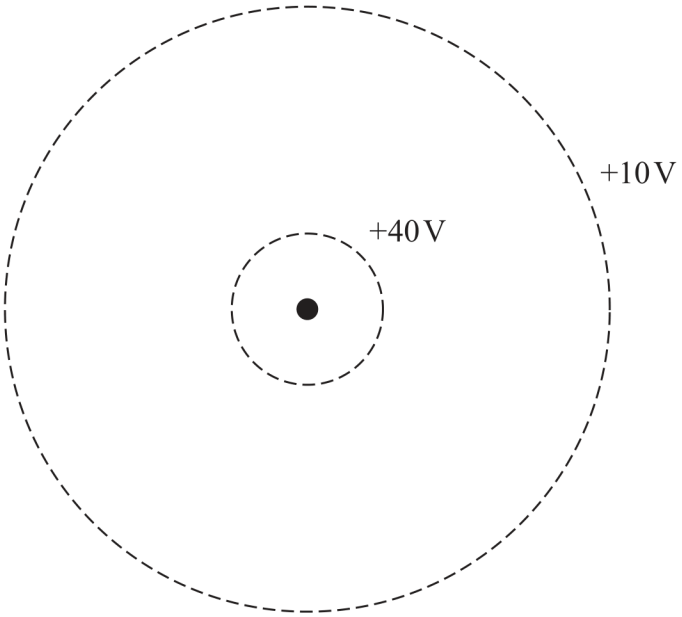
(b) The scaled diagram shows two equipotential lines in the electric field around a gold nucleus.



(i) Sketch lines to show the electric field between these two lines of equipotential.

(3)

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(ii) The 40 V line is drawn to scale correctly.

Deduce whether the 10 V equipotential line is in the correct scaled position.

(3)

(iii) An alpha particle moves from the +10 V potential to the +40 V potential.

Calculate the increase in the potential energy of the alpha particle in eV.

(3)

Increase in potential energy = ... eV

(Total for Question 15 = 12 marks)