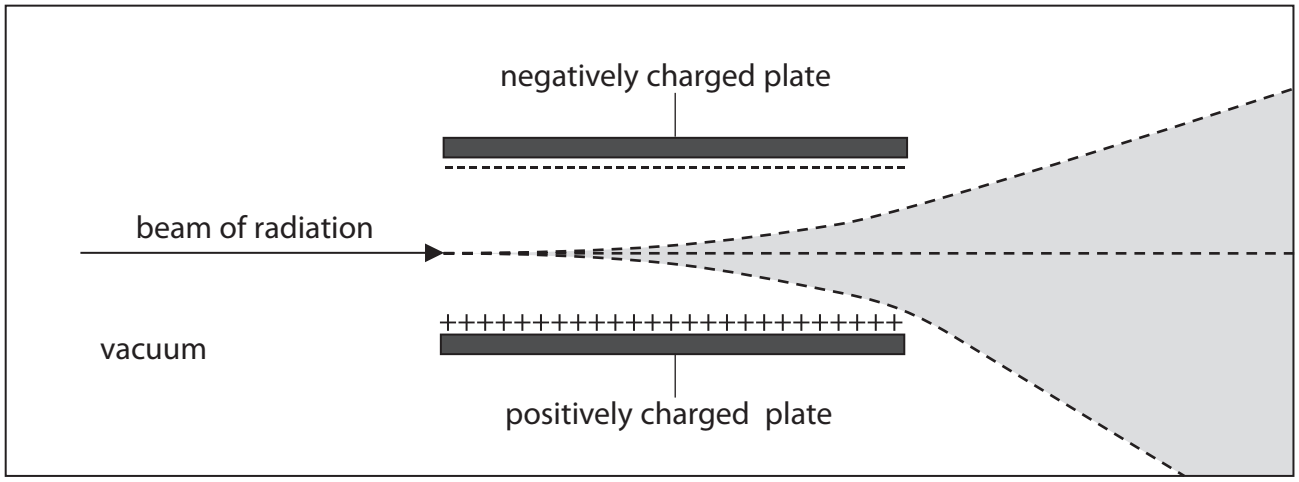
2 (a) Scientists use deflection in an electric field to help distinguish between different radiations.

The diagram shows a beam containing several types of radiation. This beam travels in a vacuum between two charged plates.

Some of the radiations are deflected upwards, some are deflected downwards and some are not deflected at all.



Put one tick in each row to show the correct deflection for each type of radiation.

One has been done for you.

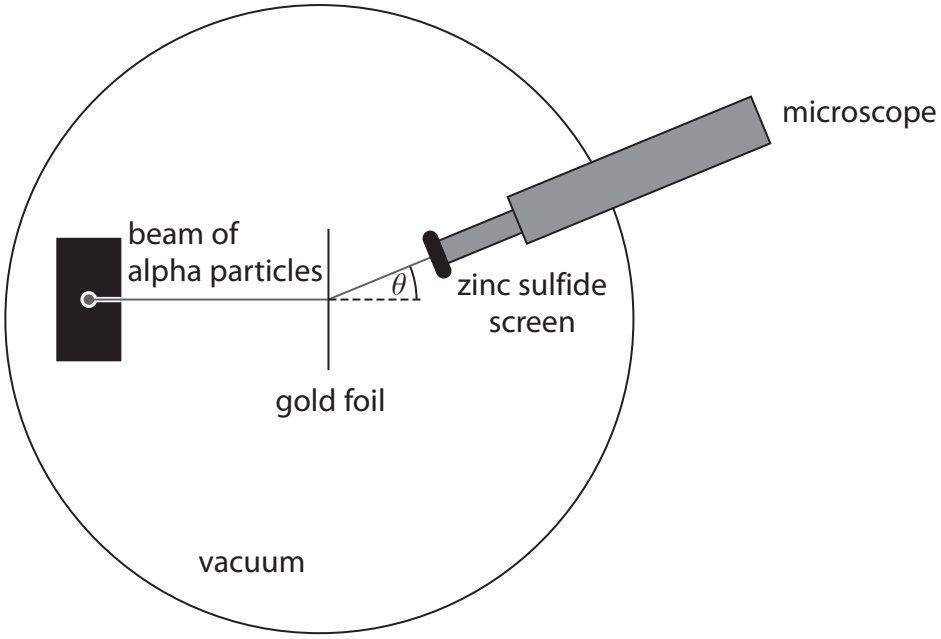
(4)

Type of radiation	Deflected upwards	Deflected downwards	Not deflected
alpha	✓		
beta			
gamma			
neutrons			
protons			

(b) The diagram shows the apparatus Geiger and Marsden used to investigate the structure of an atom.

They aimed a beam of alpha particles at a very thin sheet of gold foil.

They used a zinc sulfide screen to detect the alpha particles.



(i) Suggest why Geiger and Marsden removed the air from the apparatus.

(1)

.....

.....

.....

(ii) Describe Geiger and Marsden's results.

(2)

.....

.....

.....

.....

.....

.....

(c) Rutherford produced a model of the atom.

Describe how Rutherford's model explains Geiger and Marsden's results.

You may draw a diagram to help your answer.

(4)

(Total for Question 2 = 11 marks)

BLANK PAGE