<table>
<tr><th>Question number</th><th>Answer</th><th>Notes</th><th>Marks</th></tr>
<tr><td>2 (a)</td><td>3 or 4 ticks correct;;
OR
2 ticks correct;

<table><tr><td rowspan="2">Property</td><td colspan="3">Type of radiation</td></tr><tr><td>Alpha particles</td><td>Beta particles</td><td>Gamma rays</td></tr><tr><td>most ionising</td><td>(✓)</td><td></td><td></td></tr><tr><td>largest mass</td><td>✓</td><td></td><td></td></tr><tr><td>most penetrating</td><td></td><td></td><td>✓</td></tr><tr><td>highest speed</td><td></td><td></td><td>✓</td></tr><tr><td>negatively charged</td><td></td><td>✓</td><td></td></tr></table></td><td>ignore top line as this is given</td><td>2</td></tr>
<tr><td>(b) (i)</td><td>Number of neutrons = 2;
Number of protons 2;</td><td>Allow same ideas expressed in words</td><td>2</td></tr>
<tr><td>(ii)</td><td>Any one of-
MP1. Charge is larger (than other radiations);
MP2. Mass is larger (than other radiations);</td><td>comparative statement needed
ignore
• incorrect terminology e.g. more powerful
• references to protons and neutrons
no RA unless particles/radiation specified
condone
‘alpha particles have more momentum’</td><td>1</td></tr>
<tr><td>(c) (i)</td><td>Idea of background radiation;</td><td>Allow
Idea that some alpha particles (from source) will get through smoke
air is all around = insufficient</td><td>1</td></tr>
<tr><td>(ii)</td><td>Idea that radioactivity is random;</td><td>allow
• fluctuates
• source emits different numbers of alphas
• background radiation varies
ignore
• random movement of particles</td><td>1</td></tr>
<tr><td>(iii)</td><td>Idea that α particles are absorbed / deflected /stopped / scattered;

Idea that α particles are affected by <u>smoke</u>;</td><td>allow for both marks
smoke blocks the (alpha) particles</td><td>2</td></tr>
</table>

Total 9 marks