

1 8

When a small radioactive source is placed in a cloud chamber, straight tracks about 4 cm long are observed. The same source is placed 10 cm from a Geiger tube and a count rate is detected. When a sheet of aluminium 5 mm thick is placed between the source and the Geiger tube the count rate falls to the background count rate.

Which types of radiation are emitted by the source?

[1 mark]**A** α , β and γ **B** β and γ **C** α and γ **D** α and β **1 9**

A parallel-plate capacitor is made by inserting a sheet of dielectric material between two plates. Both plates are in contact with the sheet.

Which relative permittivity and sheet thickness give the greatest capacitance?

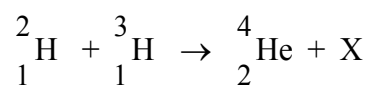
[1 mark]

	Relative permittivity	Thickness / mm	
A	2	0.40	<input type="checkbox"/>
B	3	0.90	<input type="checkbox"/>
C	4	1.0	<input type="checkbox"/>
D	6	1.6	<input type="checkbox"/>



3 0

A deuterium nucleus and a tritium nucleus fuse together to form a helium nucleus and a particle X. The equation for this process is:



What is X?

[1 mark]

A electron

B neutron

C positron

D proton

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What effect are the control rods intended to have on the average kinetic energy and number of fission neutrons in a thermal nuclear reactor?

[1 mark]

	Average kinetic energy of fission neutrons	Number of fission neutrons	
A	unchanged	unchanged	<input type="radio"/>
B	reduced	unchanged	<input type="radio"/>
C	unchanged	reduced	<input type="radio"/>
D	increased	reduced	<input type="radio"/>

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END OF QUESTIONS

