EDEXCEL A LEVEL PHYSICS · TOPIC 11

Nuclear Radiation Definitions

Learn them word for word: the highlighted words are the ones the examiner looks for.

1 **Binding energy**	Binding energy is the **energy required** to **completely separate** a nucleus into its **individual protons and neutrons**. (Binding energy = mass deficit × c^2)
2 **Nuclear fission**	The **splitting** of a **large mass nucleus** into **two smaller mass nuclei**, **releasing energy** and **two or three neutrons**.
3 **Nuclear fusion**	The **joining** of **two small mass nuclei** to form a **large mass nucleus**, **releasing energy**.
4 **Conditions for fusion**	Very **high temperature**, so the nuclei have enough **kinetic energy** to **overcome the electrostatic repulsion** between them. Very **high density**, so **collisions** happen more **frequently**.
5 **Random**	We **cannot predict** **which nucleus** will decay next or **when** a particular nucleus will decay.
6 **Spontaneous**	The decay is **not affected** by **external factors**. (such as temperature, pressure or force) *No external trigger is needed.*
7 **Activity**	The **number of nuclei** that **decay per second**.
8 **Half-life**	The **average time** taken for the **number of undecayed nuclei** of a sample to **halve**.

📌 **Stick me by your desk.** Read me every time you sit down. Cover the right-hand column and say each one out loud. Practise online: **physicswithkate.com/a-level-nuclear-radiation-definitions**