

## Chapter 5 Radioactive decay and half-life. (Revision Questions page 183). Multiple Choice Answers

Q	Ans	Explanation
1	A	We think of a positron as a positive electron.
2	C	<p>Time for <math>\frac{1}{8}</math> remaining:</p> <p>Start <math>N_0 = 1</math></p> <p>1 half-life <math>N = \frac{1}{2} N_0</math></p> <p>2 half-lives <math>N = \frac{1}{4} N_0</math></p> <p>3 half-lives <math>N = \frac{1}{8} N_0</math></p> <p>Three half-lives  <math>= 3 \times 20</math>  <math>= 60</math> days</p> <p>Alternatively:</p> $N = N_0 \left(\frac{1}{2}\right)^n$ $n = \log_{\frac{1}{2}} \left(\frac{N}{N_0}\right)$ <p><math>\frac{7}{8}</math> disintegrated</p> <p>thus <math>\frac{1}{8}</math> remaining</p> $n = \log_{\frac{1}{2}} \left(\frac{1}{8}\right)$ <p><math>n = 3</math></p> <p><math>t = t_{\frac{1}{2}} \times 3</math></p> <p><math>t = 20 \times 3</math>  <math>= 60</math> d</p>
3	D	In A and B, the nuclear charge (bottom numbers) don't balance. For C, the neutron should be written as ${}^1_0n$ so the mass numbers (top numbers) won't balance.
4	B	The missing particle is ${}^{92}_{37}\text{Rb}$ which has 37 protons and 55 neutrons.
5	D	Beta negative particles are electrons, so the neutrino associated with electron production is an electron neutrino. That's what always happens. Just learn it.

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