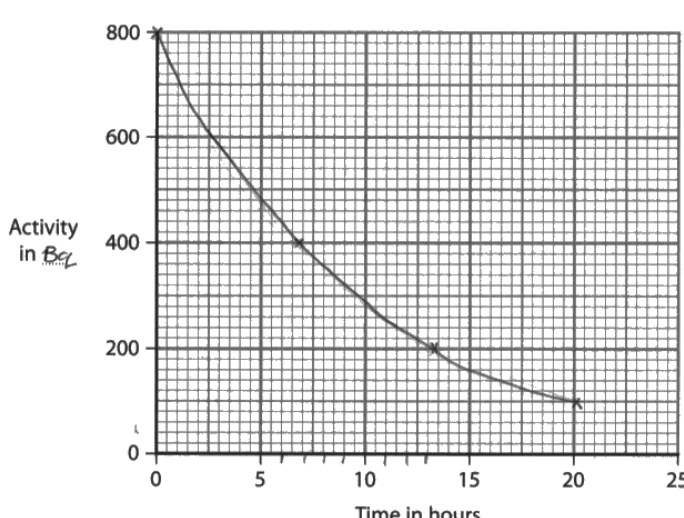


Question number	Answer	Notes	Marks
7 (a) (i)	becquerel(s);	allow kilobecquerels, Bq, kBq, curie, Ci allow recognisable spelling allow mixed case letters	1
(ii)	<p>evidence that sketch starts at (0,800)</p> <p>evidence sketch passes through (6.7,400)</p> <p>smooth curve decreases with decreasing steepness</p> 	<p>accept plotted point</p> <p>accept plotted point</p>	3
(iii)	<p>both numbers for beta correct; atomic number of protactinium = 91;</p> <p>e.g.</p> ${}_{91}^{234}\text{Pa} \longrightarrow {}_{92}^{234}\text{U} + {}_{-1}^0\beta$		2

(b)	(i)	A (count measured by the detector); B is incorrect because this is a control variable C is incorrect because this is the independent variable D is incorrect because this is a control variable		1
	(ii)	idea of removing source (from the experiment); measure count(for a minute); subtract background count from results;	e.g. pointing source away, keeping source in its box, (huge) increase in distance, take count before using source	3
	(iii)	idea of repeating measurements (of count); to determine a mean value;	allow idea of using repeats to identify anomalies condone average for mean	2
	(iv)	count decreases (significantly) using paper; no (additional) effect on the count when using aluminium AND lead / eq; radiation must be alpha consistent with candidate's discussion;	both must be mentioned for this mark allow idea that count with aluminium and lead is background radiation / in the range of 11-14	3

Total for Question 7 = 15 marks