Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic : 6_ Radioactivity

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Name of the Student:_____
Max. Marks : 19 Marks **Time : 19 Minutes**

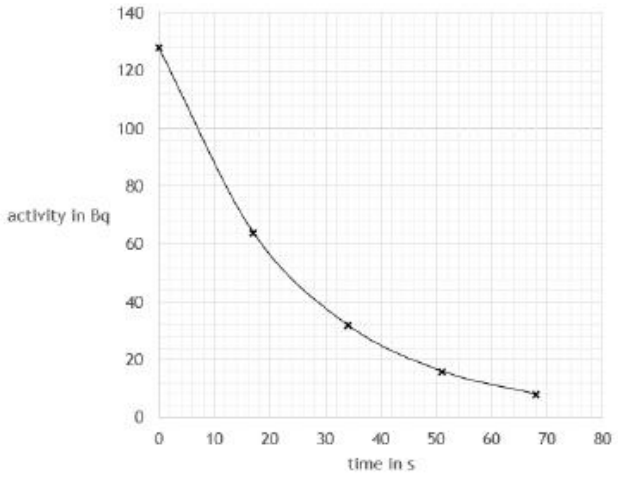
Mark Schemes

Q1.

Question Number	Answer	Acceptable answers	Mark
(i)	1250 (million years) (1)	Between 1200 and 1300 (my) inclusive	**(1)**

Question Number	Answer	Acceptable answers	**Mark**
(ii)	2 half lives (1) 2500 (million years) (1)	 Allow ecf from (bi) Give full marks for answer between 2400 and 2600 with no working.	**(2)**

Q2.

	Answer	**Additional guidance**	**Mark**
	plots at three of: 17,64 (1) 34,32 (1) 51,16 (1) 68,8 (1) tolerance ±1 s ±4 Bq	 allow line passing through correct point(s) ignore incorrect curve if no other marks scored allow 1 mark for evidence of halving activity e.g. 128 to 64	**(3)** **AO3**

Q3.

Question Number	Answer	Additional guidance	Mark
(i)	Geiger (Müller counter) (1)	GM (tube/meter) or other appropriate detector e.g. dosimeter, film badge, scintillation counter accept incorrect spellings such as "giga" ignore radioactive counter	**(1)**

Question Number	Answer	Additional guidance	Mark
(ii)	any **two** acceptable sources from **cosmic** (rays) (1) Sun (1) rocks / ground (1) {nuclear / atomic} tests / nuclear waste (1) (nuclear) power stations (1) plant (sources) (1) buildings (1) food (1) water (1) medical (1) radon (1)	 cosmic microwave background radiation (CMBR) accept nuclear accidents (Chernobyl, Fukushima etc) accept named foods accept X-rays, radiotherapy ignore alpha, beta, gamma	**(2)**

Q4.

Question Number	Answer	Additional guidance	Mark
	a description that combines 4 points from the following: 1. put rock(s) in front of/near tube (1) 2. measure (count rate) separately for the two different rocks (1) 3. measure each count for the same time period (1) 4. keep source-detector distance the same for both rocks (1) 5. take (into account)/ measure background count (1) 6. repeat readings and take average(s) (1)	not "in" tube keep rocks apart	**(4)** AO 2 2

Q5.

Question Number	Answer	Additional guidance	Mark
	in this order infrared (wave) / IR (1) micro(wave) (1) radio (wave) (1) gamma (ray/wave)(1)	accept μ(wave) accept γ not X	**(4)** AO 1 1

Q6.

Question number	Answer	Mark
	A | same atomic number | different number of neutrons Options B, C and D have wrong combinations	**(1)**

Q7.

Question number	Answer	Mark
	one from • same atomic number (1) • same number of protons (1) • same element (1) and one from • different numbers of neutrons (1) • different mass numbers (1)	**(2)**

Q8.

Question number	Answer	Additional guidance	Mark
(i)	An explanation to include; there is no aluminium to absorb β particles (1) (therefore) more β particles reach the G-M tube (1)	aluminium absorbs/stops/blocks beta particles accept reverse arguments accept radiation for beta particles	**(2)** **AO2**

Question number	Answer	Additional guidance	Mark
(ii)	(idea of) background radiation	a named source of background radiation	(1) AO3

Question number	Answer	Additional guidance	Mark
(iii)	becquerel	accept Bq accept close spelling	(1) AO1

Q9.

Question	Answer	Additional guidance	Mark
	an explanation linking three from use of G-M tube (with counter) (1) no (obvious) radioactive sources present (1) measure (number of) counts in a given time (1) divide number of counts by time (1) repeat readings (1) calculate the average value (1)	 allow Geiger counter / rate meter allow measure count rate / activity if rate meter used take readings in different positions in laboratory	3 AO3.3

Q10.

Question number	Indicative content	Mark
	An explanation that combines identification via a judgment (2 marks) to reach a conclusion via justification/reasoning (1 mark): • some alpha particles go straight through (1) • some alpha particles scattered (1) • idea of all mass / (positive) charge concentrated in centre /nucleus (1) • mainly empty space (in rest of atom) (1)	**(3)**